CORMIDI
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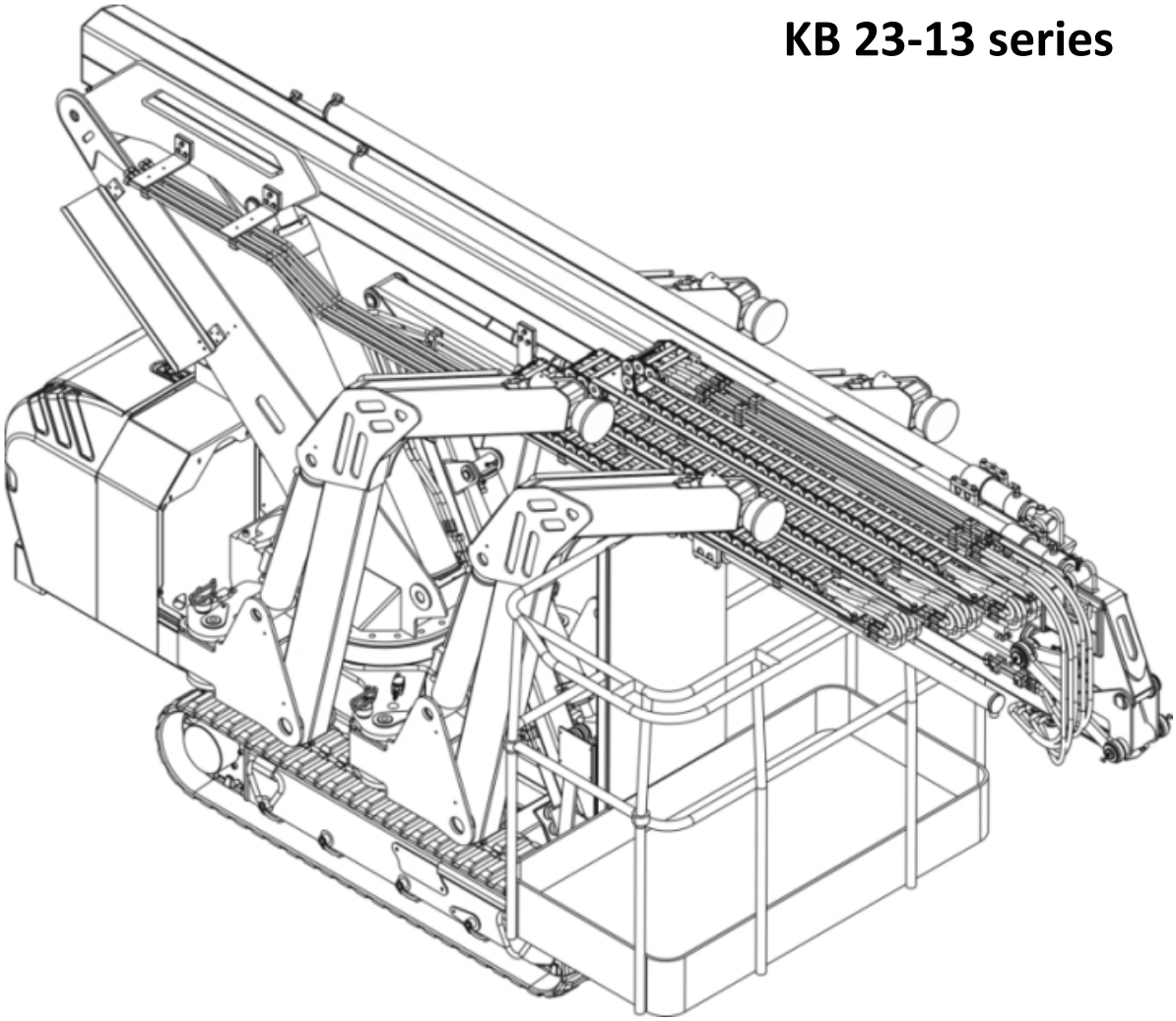
INSTRUCTION MANUAL
USE AND MAINTENANCE FOR ELEVATING WORK PLATFORMS
EWP
KB 23-13 series



2013

KB-series

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0. INTRODUCTION

0.1. APPLIED STANDARDS AND LAWS

This manual has been issued by the Manufacturer and is an integral part of the machine: it has been issued in Italian, original language of the manufacturer, in compliance with point 1.7.4 of directive 2006/42/CE.

The platform (EWP) is conforming with the law provisions related to Directives 2004/108 EC and 2006/95 EC

In the applicable points, it is conforming to the harmonized standard UNI EN 280.

SAFETY STANDARDS

The device has been manufactured in compliance with the Harmonized Technical Standards listed below:

UNI EN ISO 12100-1	Safety of machinery - Basic concepts general principles for design – (Part 1: Basic terminology methodology).
UNI EN ISO 12100-2	Safety of machinery - Basic concepts general principles for design – (Part 2: Technical principles).
UNI EN ISO 13857	Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs.
UNI EN ISO 13850	Safety of machinery - Emergency stop - Principles for design.
CEI EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements.
UNI EN ISO 14121-1	Safety of machinery - Risk assessment - Part 1: Principles.
UNI EN 982	Safety of machinery. Safety requirements for systems and components for oil hydraulic and pneumatic transmissions. Hydraulic fluid power.
UNI EN 983	Safety of machinery. Safety requirements for systems and components for oil hydraulic and pneumatic transmissions. Pneumatics.
UNI EN 953	Safety Of Machinery - Guards - General requirements for the design and construction of fixed and movable guards.
UNI EN 349	Safety of machinery - Minimum gaps to avoid crushing parts of the body.
UNI EN 280	Aerial platforms
ANSI/SIA A92.5:2006 & CSA 354.1:2004 & ANSI B30.5:2011	American National Standard Boom-Supported Elevating Work Platforms

0.2. USE OF THE MANUAL

This instruction manual provides information on transport, use and maintenance of the platform (EWP), which is also referred to as machine.

Before starting the machine, the operator must have read and understood the instructions provided, especially those regarding safety.

If doubts arise on the correct interpretation of the instructions, contact the Manufacturer or the authorized Assistance Centers for any clarifications.

0.3. STORING THE MANUAL

This manual is an integral part of the platform (EWP) and it must:
- be stored in a place easy to access, dry and repaired from sunlight;
- be attached to the machine in the event of transfer of property and it must be stored intact for the entire life of the platform (EWP), until its demolition.

In the event it is lost or worn, a new copy must be requested to the Manufacturer.

0.4. DISCLOSURE LIMITATIONS OF THE MANUAL

Technical information contained in this instruction manual are property of Cormidi Srl and must be considered confidential. Therefore, its reproduction, even partial, without written authorization of the Manufacturer is prohibited.

Moreover, using this manual for purposes different from that indicated is prohibited.

Any violations will be prosecuted to the full extent of the law.

0.5. SYMBOLS USED IN THIS MANUAL

The symbols are used to highlight the operations involving risks, for safety purposes.

In order to operate safely, the highlighted instructions indicating useful information and important procedures must be complied with.

DANGER:
indicates an imminent hazardous situation that may cause injuries or death for non-compliance with the instructions.

ATTENTION:
indicates an potential hazardous situation that may cause serious injuries or death for non-compliance with the instructions.

CAUTION:
indicates a potential hazardous situation that may cause injuries to the operator or damage the machine for non-compliance with the instructions.

0.6. WAYS OF READING AND CONSULTING THE MANUAL

The manual is divided into chapters, according to an order of presentation of the information.

The index facilitates displaying information and allows identifying it quickly.

The instruction manual consists in a cover, index and a series of chapters (sections).

Every figure is combined with a progressive number for each chapter.

Abbreviations:

Sec. = section
Chap. = chapter
Para = paragraph
Pg = page
Fig. = figure
Tab. = table

Unit of measure.

The units of measure are those indicated in the international system (IS).

ATTENTION:
- This instruction manual provides some illustrations of the platform (EWP) with removed guards or panels.
- Never use the machine without the guards and protection devices.

0.7. UPDATE OF THE INSTRUCTION MANUAL

The Manufacturer reserves the right to modify the project and implement the machine without informing the Customers or updating the Manual already delivered to the user.

Furthermore, in the event modifications have been applied to the machine at the Customer's premises, which have been agreed with the Manufacturer and involve the modification of the Instruction Manual, the manufacturer will send to the holders the chapters involved with its new global revision model.

According to the indications of the updated documentation, the user is responsible for replacing the old chapters of the all the copies held with the new ones, as well as the initial page and index of the new revision level.

The manufacture is responsible for the descriptions indicated in Italian; any translation cannot be fully verified, therefore, if an incongruence is detected, refer to the Italian version and contact our Sales Office, who will carry out the due modifications.

0.8. GLOSSARY AND PICTOGRAMS

This paragraph indicates uncommon terms or terms with meaning different from the common one.

The abbreviations used are described below as well as the meaning of the pictograms to indicate the qualification of the operator and status of the machine; their use allows providing information on the proper and safe use of the machine quickly and univocally.

Dangerous zone: Zone inside and/or close to the machine, where the presence of a exposed person is a risk for his/her safety and health.

Exposed person: Any person who is found, entirely or in part, in the dangerous zone

Operator: A person in charge to install, run, adjust, carry out maintenance, clean, repair and transport the machine

Man-machine interaction: Any operation where the operator must interact with the machine during any phase of the operation;

Qualification of the operator: Minimum level of skills the operator must have to carry out the operations described above;

Number of operators: The number of operators, assessed by the manufacturer, must be suitable for carrying out the described operation; therefore, a different number of operators can compromise the expected result or endanger the safety of the involved personnel.

Status of the machine: the status of the machine includes the operation mode, e.g. the drive, stop, etc, safety conditions on the machine, such as protection devices (include and excluded), emergency button pressed, insulation type of energy sources, etc.

Residual danger: A danger that has not been possible to remove or reduce during the designing phase, against which the protection devices are not (totally) effective; the manual provides information about it and instructions and warnings to allow solving it (see 5.4 and 6.5.1 of European standards EN 12100-1 and EN 121000-2);

Safety component: Component used to ensure safety, whose failure or malfunction affects safety and/or health of the exposed persons (e.g. lifting equipment, fixed, mobile or adjustable guard, electric, electronic, optical, pneumatic or hydraulic device that interlocks a guard, etc).

Elevating mobile work platform (EWP): machine that allows one or more persons to reach high positioned workstations being inside a work platform.

Work platform: Closed platform (cage) or cabin that can be moved under load in the required work position and from which operations, such as repairs, inspections or similar, can be carried out.

Extendable structure: structure connected to the base frame and work platform. Consisting in pantograph telescopic or articulated arms that allow handling the work platform.

Frame: Base of the EWP.

Outriggers: mechanisms used to stabilize the EWP, made with extendable arms and hydraulic jacks.

P&T: arm lifting and lowering movement arm around a fulcrum.

Jib: extendable articulated arm that connects the work platform (cage) with the telescopic arm.

Crane: fixed arm with a hook for the use of the machine as a crane.

Winch: fixed structure equipped with hydraulic winch for the use of the machine in the configuration winch.

Pictograms provide very important information/provisions, especially concerning safety. Failure to comply with them can involve:

- **danger for the safety of the operators;**
- **loss of the warranty;**
- **declination of the responsibility of the manufacturer**

SAFETY PICTOGRAMS

- Pictograms inside a triangle indicate DANGER.
- Pictograms inside a circle impose OBLIGATION/PROHIBITION.
- Pictograms inside a rectangular indicate a provision that if not carried out can involve serious danger.

Dangerous electric voltage

Generic danger.

Danger of crushing lower limbs.

Danger - Always stabilize on a solid and consistent ground.

No access for unauthorized persons.

Safety harness must be worn.

Prohibition to pass through the limit allowed of the live electric lines.

Prohibition to use any object to reach heights exceeding that indicated in the work area diagram.

Prohibition to loads using the work platform.

Prohibition to carry out welding, perforation, grinding or any other operation that can weaken the structure without authorization of the manufacturer.

Danger, do not use with wind, which intensity exceeds that indicated.

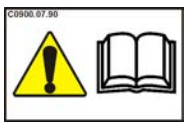
Wearing protective gloves must be worn.

Foot protection must be worn.

Head protection is mandatory.

The label on the side indicates you must read and understand operator's manual and all other safety instructions before using this equipment *(cod. C0900.07.82)*.

The label on the side indicates to read the technical documentation before carrying out any operation (e.g. manual attached to the Motor) *(cod. C0900.16.59)*.

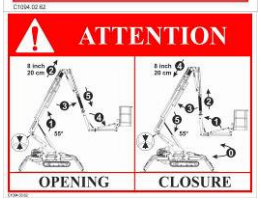


The label on the side indicates to read the use and maintenance manual before using the devices close to the plate, to avoid inconveniences *(cod. C0900.07.90)*.

The label on the side indicates that the battery can be disconnected from the machine electric circuit, by using the **battery cut-off switch**, linear the plate *(cod. C0900.20.63)*.

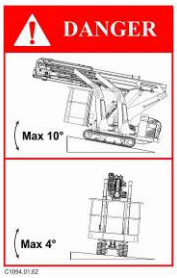
SAFETY DISTANCE

Label that indicates serious danger to approach and stop in the machine range of action, as there is an imminent risk of hazard *(cod. C1094.02.02)*.



OPENING AND CLOSURE

Label that indicates the sequence of the actions required to open and/or to close manually the arm of the platform *(cod. C1094.03.62)*.



MAXIMUM SLOPES

Label that indicates the slopes that can be faced in safe conditions with the platform in the transport configuration. Avoid surfaces with transversal slopes exceeding 4° and longitudinal slopes exceeding 10°, to prevent the risk of tilting with possible serious consequences for the operator's safety. Anyway, the ground must be solid and stable *(cod. C1094.01.62)*.

CRUSHING

Label that indicates a potential risk of crushing, which can cause serious injuries or death *(cod. C1094.09.02)*.

SHEARING

Label that indicates a potential risk of shearing, which can cause serious injuries or death *(code C1094.03.02)*.

HOT SURFACES

Invites to caution, as there is risk of burning due to the possibility to contact hot surfaces *(code C1094.07.02).*

CAUTIOUS PROCEDURES

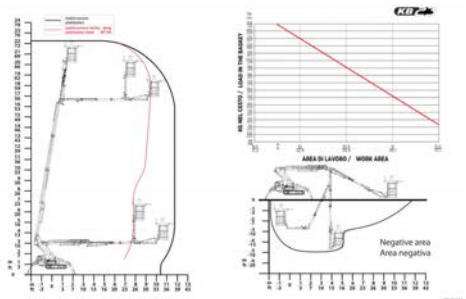
This label states to be cautious, remembers to take all the accident prevention measures, regarding the use of personal protective equipment *(cod. C1094.04.02)*.

The meaning of the pictograms is the following:

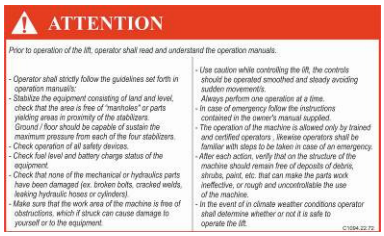
- Read the manual before starting the machine the first time, every time the operator changes and every time a doubt on its operation arises;
- Wear hearing protection or other suitable devices;
- Wear suitable protective gloves;
- Wear suitable accident-prevention shoes.

Requirement label
Indicates the point where the operator safety belt MUST be secured, before ascending.

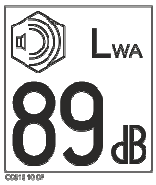
Warning label
indicates the operator the maximum **workspace** that the platform (EWP) can reach.



Danger label
Indicates the presence (inside the panels) of current with **110 Volts voltage (or 220 Volts, depends on the configuration)**.


ATTENTION
Prior to operation of the lift, operator shall read and understand the operation manuals.
- Operator shall strictly follow the guidelines set forth in operation manuals's;
- Stabilize the equipment consisting of land and level, check that the area is free of "manholes" or parts yielding areas in proximity of the stabilizers. Ground / floor should be capable of sustain the maximum pressure from each of the four stabilizers.
- Check operation of all safety devices.
- Check fuel level and battery charge status of the equipment.
- Check that none of the mechanical or hydraulics parts have been damaged (ex. broken bolts, cracked welds, leaking hydraulic hoses or cylinders).
- Make sure that the work area of the machine is free of obstructions, which if struck can cause damage to yourself or to the equipment.
- Use caution while controlling the lift, the controls should be operated smoothed and steady avoiding sudden movements.
Always perform one operation at a time.
- In case of emergency follow the instructions contained in the owner's manual supplied.
- The operation of the machine is allowed only by trained and certified operators , likewise operators shall be familiar with steps to be taken in case of an emergency.
- After each action, verify that on the structure of the machine should remain free of deposits of debris, shrubs, paint, etc. that can make the parts work ineffective, or rough and uncontrollable the use of the machine.
- In the event of in climate weather conditions operator shall determine whether or not it is safe to operate the lift.

Information label
Information label which states operational procedures and restrictions.



Warning label
Indicates the maximum **acoustic pressure** value emitted by the machine.

Warning label
Indicates the point where the **ground plate** to the machine.

Warning label
Indicates the operator the **maximum capacity** depending on the version:
1) the maximum load that can be lifted;
2) the maximum number of operators inside the work platform.

Warning label
Indicates the maximum value of pressure under each stabilizers. Ground / floor should be capable of sustain the maximum pressure from each of the four stabilizers.
WARNING: Use always the platform with the factory plates under the stabilizers.

Warning label
The first indicates the **lifting or fixing points**, where the machine can be secured for transport *(cod. C0900.13.68)*. The second indicates the points for the **fixing only by expressly prohibiting the lifting** *(code C0900.13.71)*.

Label that indicates that the product meets the EU safety, health and environmental protection requisites.

1. GENERAL INFORMATION

Identification plate

CORMIDI
leadinginnovation
Via Fonte, 342 - 84069 ROCCADASPIDE (SA) ITALY
tel. +39 0828 943688 - fax +39 0828 943963
www.cormidi.com - info@cormidi.com
CE
A MODEL:
B S / N:
C BUILT:
D MACHINE WEIGHT: kg
E MAX OUTREACH: m
F MAX HEIGHT PLANE BASKET: m
G MAX HYDRAULIC PRESSURE: bar
H ELECTRICAL RATING: V / 50 Hz
I BASKET CAPACITY (2 PERSONS): 250 Kg
L MAX HORIZONTAL LOAD: 50 daN
M WIND SPEED MAX: 12,5 m/s
N MAX CHASSIS LEVEL: 1°
C1094.14.95

A - Model of the platform (EWP);
B - Serial number;
C - Year of manufacture;
D - Mass of the platform;
E - Maximum outreach extension of the platform is safe conditions;
F - Maximum dimensions on the ground with lowered outriggers;
G - Maximum pressure of the hydraulic system;
H - Electric system voltage of the platform;
I - Maximum weight in the work platform with two operators on board;
L - Maximum manual force carried out by the operator outwards the work platform;
M - Maximum wind speed allowed for working with the platform;
N - Maximum inclination of the machine frame allowed for working on the platform in safe conditions.

Note
Altering the data on the identification plate is strictly prohibited.

1.1. IDENTIFICATION DATA OF THE MANUFACTURER

CORMIDI srl
Via Fonte, 342 - 84069 ROCCADASPIDE (SA)
tel. +39 0828-943688 - fax +39 0828-943963
e-mail: info@cormidi.com

The machine has been manufactured in compliance with the European, US and Canada Standards in force at the time it has been launched on the market.

1.2. WARRANTY

Unless otherwise agreed, the warranty:
1) has a duration of 12 months from the date of delivery to the Customer;
2) entirely covers replacements or repairs of all the components of the platform (EWP) presenting defects in the materials or processing;
3) The Cormidi Srl workshops are the only enabled to carry out operations under warranty;
4) replacements or repairs will be carried out as soon as possible at Cormidi Srl Authorized Workshops in relation to the requirements of the Manufacturer and its personnel; any delay in applying the warranty does not entitle the purchaser to claim damages or extend the warranty period.
5) This warranty does not cover:
   a) electric components (lams, fuses, solenoids, etc.)
   b) parts subject to normal wear (slides, gaskets, oil filters, etc.)

c) any other component not manufactured by Cormidi Srl (for which the relative warranty will be provided by the original supplier).

6) The warranty becomes null and void in the following cases:
   a) tampering with or modification of the platform (EWP) and its components;
   b) alteration of pressures and/or removal of the seals of the hydraulic system valves;
   c) improper use of the platform (EWP);
   d) use of oils and filters different from those recommended by Cormidi Srl;
   e) use of non-original spare parts or non-specific for the model;
   f) operations carried out by workshops not authorized by Cormidi Srl;
   g) use of non-suitable propulsion components (such as internal combustion engines) and with characteristics different from those indicated by Cormidi Srl;
   h) assembly of devices, accessories and equipment not approved by Cormidi Srl.
7) Cormidi Srl reserves the right to apply any modification deemed necessary to improve its products without obligation to apply those modifications on recently manufactured platforms (EWP), which have been delivered or that are in the process of being delivered or have been ordered.
8) For none of the above-mentioned clauses, the purchaser can claim direct or indirect damage, extension of the warranty, termination of the contract or delay payments.

1.3. DISCLAIMER

The manufacturer is not liable for:
- improper use of the platform;
- unauthorized modifications or interventions on the platform;
- failure to comply with traffic rules and standards regarding transport of the machine from one worksite to another;
- failure to comply with the instructions, totally or partially;
- poor maintenance;
- use of non-original spare parts or non-specific for the model;
- event due to environmental disaster or socio-political events.

1.4. DEFINITIONS

Dangerous zone:
any zone, inside and/or close to the machine, where a person is exposed to the risk of injuries or harmful for health.

Exposed person:
any person who is found, entirely or in part, in the dangerous zone.

1.5. PERSONNEL IN CHARGE

Operator:
the person or persons in charge of running the platform (EWP).

User:
the person, body or company that has purchased or rented the machine for proper use.

Specialized personnel:
individuals who have achieved a specific study and thus are able to recognize the dangers arising from the use of the machine and may be able to avoid them.

Authorized persons:
qualified personnel enabled by the user to carry out specific operations.

1.6. ATTACHED MANUALS

For the proper use of the platform (EWP) refer to:
- use and maintenance manuals of the platform;
- instruction manual of the combustion motor.

1.7. GENERAL SAFETY WARNINGS

Behaviors to be taken when using the platform (EWP) for yours and others safety.

- Do not allow unauthorized personnel to use the machine.

- Stabilize the platform on a steady ground, with limited inclinations and away from ditch edges, excavations and manholes, etc. The ground must always be in the condition to react to the maximum stress indicated on the outriggers plates.

- Start the machine only if the work zone is clear from operators and any obstacle that can detect moving parts.

- The operator on the work platform must wear the protective helmet, the provided clothes and safety belt, which must be secured to the work platform.

- Do not protrude from the work platform: keep the work position, resting the feet on the pavement.

- The provided helmet and clothes must be worn also by the operator at the base of the platform.

- Do not climb on the work platform when is already developed or get down of it if it has not reached the rest position.

- All the operations required to reach the operation point must be carried out by the operator inside the work platform.

- The operation from the ground is allowed only in emergency conditions.

- Activate the levers gradually and gently to avoid rough movements.

- Pay the utmost attention during the drive near docks, slopes or slippery surfaces.

- Operations carried out near electric lines of low voltage zones require the utmost attention and caution to avoid accidental contacts with the platform (EWP) arms and lines; anyway, comply with the relative standards in force.

- When operating near electric lines, the operator must request the manager or supervisor special instructions and specific indications on how to carry out the work; these instructions will be studied complying with the relative standards in force and must be strictly followed.

- Park the machine on a solid and flat ground, which must also be sufficiently large to allow inspections.
If this condition cannot be implemented, and therefore the machine is parked in an authorized slope, align it according to the direction of the slope, never transversally, and apply safety wedges under the tracks.

- Stop the motor; if possible, remove the keys and immediately disconnect the main electric switch at the bottom left, behind the track (Battery cut-off switch, see fig. on the side).

2. SAFETY

2.1. INTENDED USE

Before starting the Machine, read and follow the instructions contained in this Manual.

The machine can run indoors or outdoors, but always without rain, snow or strong wind (see technical data).
The platform (EWP) can be used for high operations in the following sectors:

- construction (wall sandblasting, maintenance and coverings, structural reliefs and restorations);
- agricultural (plant pruning);
- industrial (electric line maintenance without current).

Any use different from that stated, not included or that can be supposed in this manual is considered improper and, therefore, **not allowed**.

The manufacturer has made every effort in designing this machine, making it as much as possible safe.

The machine is also equipped with all the protection and safety devices, as well as all the required information for a safe and proper use.

For this purpose, the following information has been added:
- Minimum qualification required for the operator;
- Number of operators required;
- Status of the machine;
- Residual risks;
- Required or recommended personal protective equipment;
- Prevention of human errors;
- Prohibitions/obligations on misconduct that can be reasonably predicted.

The user can integrate the information provided by the manufacturer with additional work instructions on the specific use, which, obviously, must not contradict that indicated in this Manual, in order to contribute to a safe use of the machine.

IMPORTANT: The manufacturer is not liable for damage that the machine causes to persons, animals or in the following cases:
- use of the machine by not suitably trained personnel;
- improper use of the machine;
- electric, hydraulic or pneumatic supply defects;
- improper installation;
- poor maintenance;
- unauthorized modifications or interventions;
- use of non-original spare parts or non-specific for the model;
- failure to comply with the instructions, totally or partially;
- failure to comply with specific national standards;
- disasters and exceptional events.

General requirements

- Mobile elements must always be used according to that indicated by the manufacturer, as specified in this Manual, which must always be available in the work site.
- In order to prevent accidents and ensure safety, all the safety devices placed on the mobile components must not be modified or removed, but be suitable preserved.
- **The user must immediately inform the employee or his supervisor about any defects or anomalies detected on the mobile components.**
- always operate smoothly; do not start or release the controls roughly, to prevent unexpected and dangerous oscillations:
- replace the warning plates when worn;
- always stabilize the platform on compact and solid surfaces;
- if the operation must be carried out indoors, use electric power units; should this not be possible, ventilate the room or discharge the gases outwards. Use masks or respirators;
- ensure that no one passes under the platform when in operation; cordon off the dangerous zones.
- ensure that the weight of the operators together with that of the equipment to carry on the cage does not exceed the allowed value;

- When working at a height, pay attention that no material hits the platform structure (trunks, pruning branches);
- when painting or sandblasting walls, ensure that debris, sand or other material does not deposit on the machine structure, affecting its smoothness and wearing the arm, rods and gaskets, in order to safeguard the proper operation of the platform and prevent the plates and indications from being illegible;
- always keep a safety distance from the electric lines or live electric apparatus.

Checks and inspections

- Inspections must be carried out as indicated in this Instruction Manual.
- Should worn or defective parts not be immediately replaced, the manufacturer is not liable for damage caused by accidents, which can occur.
- Inspections must be carried out by a skilled person; they must be visual and functional checks, in order to ensure the machine safety.
- These include:
- inspection of all the bearing structures, which must not have cracks, breakage, damage, deformations, corrosion, wear or alterations compared to the original characteristics;
- inspection of all the mechanical components;
- inspection of all the safety devices installed on the machine;
- inspection of all the connections with pins and screws;
- functional inspection of the machine;
- inspection of the state of the machine;
- verification of the seal and efficiency of the hydraulic system.
- The results of this inspection must be indicated on a specific sheet of the inspection register and forwarded to the manufacturer of the machine.

ATTENTION: Detected anomalies must be removed before restarting the machine; the inspection expert must indicate the repair on the sheet, authorizing the use of the machine.

Should operation anomalies be detected, set the machine out of service and carry out the specific inspections and/or repairs before using it again**.**

- Ensure that after any maintenance operation, no object is left between the moving components.
- Wear approved accident-prevention clothes.
- Do not wear clothes or items that can get caught in the moving parts of the machine.
- Replace the worn warning and instruction adhesives on the crane and add those missing.
- Ensure that the work zone is suitable for the EWP performance and operations to be carried out.
- Ensure that the operation and work zones are suitably illuminated and visible.
- Should operations be carried out indoors, ensure that the room is suitably ventilated before starting the combustion motor.
- Suitable delimit the workspace.
- Ensure no persons are found in the platform range of action.
- Ensure that no dangerous situations can occur for the safety of the persons.
- Ensure that the safety devices are operating and efficient.
- Removing or modifying the safety devices is prohibited.
- Use outriggers to stabilize the machine.
- Ensure that the outriggers rest on a solid ground.
- Use supporting plates in the event the ground is slippery and not solid.
- Pay attention that the outriggers do not rest on an uneven ground, as they can get damaged.
- Do not operate if the EWP is damaged.
- Do not overload the EWP.
- Comply with the EWP work diagram.
- **When operating with low temperatures, perform some idle running so that the hydraulic oil can reach the operating temperature**.
- Unauthorized persons cannot circulate inside the workspace.
- Operating close to electric lines is prohibited.
- It is mandatory to keep at least 16.4 feet (5 meters) from the electric lines.
- Hold firmly on the work platform when ascending and descending.
- It is mandatory to use the safety belts during the several operations.
- The manual controls must be activated slowly and gradually.
- Avoid making the platform oscillating; e.g. with rough movements.
- Verify the stability of the EWP during the several operation phases.
- Keep a suitable safety distance from obstacles.
- Avoid contact with fixed (buildings, etc.) and moving (vehicles, cranes, etc.) objects.
- Do not perform towing or pushing operations with the EWP.

- Ensure that the outriggers are in transport mode position, i.e. fully lifted, before handling.
- Ensure that the EWP is in transport mode position, before handling with the tracked drive.
- Ensure that the main/joint arm has been blocked before moving the machine.
- Ensure that the height is suitable to prevent impacts against tunnels, bridges, subways or other obstacles that can be met.

- **When moving the EWP**
- Drive slowly and with caution.
- Verify that the route is suitable for the platform dimensions.

- **Before use**
- Carry out the daily inspections as indicated in the chapter on maintenance.
- Wear approved accident-prevention clothes.
- Fasten the safety belts.
- Close the protection device of the platform access.
- Ensure that all the controls and safety devices are efficient.
- Ensure that all the operators have been informed on the use and maintenance rules.

- **During use**
- Pay attention when moving, properly assess any obstacle.
- Pay attention to the safety standards affixed on the platform.
- Do not pull or push from the platform.
- Do not protrude from the railing.

- **After use**
- Ensure that both the structure and platform are in the correct rest position and that the outriggers are fully closed.

2.2. UNAUTHORIZED USES

Standards and prohibitions

never position ladders or other structures inside the cage to increase height.

never operate close to high voltage electric lines and anyway the cage must always be kept at least 16.4 feet (5 meters) away from the cables.

never use the EWP in presence of wind at a speed exceeding the values indicated in the identification plate.

The operation from the ground is allowed only in case of emergency. All the operations required to reach the intervention point must be carried out from the cage.

Pay attention that the outriggers do not lower on your or others feet.

Before use, verify the efficiency of the machine and its apparatus.

The EWP must always be kept in perfect conditions, following the maintenance program described in the use and maintenance manual.

in the event of oil leakage in the hydraulic system: do not get too close to the leakage! Oil sprays can cause serious injuries, as the oil in the hydraulic circuit is at high pressure. Press the emergency stop button.

do not use the machine during storms. Danger of being hit by lightning.

connect the ground conductor to the ground loop, in order to protect against the indirect contacts for external connection with voltages exceeding 24 V.

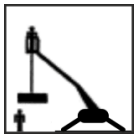
According to the accident-prevention standards in force, the operator in the platform must wear the protective helmet and fasten the safety belt secured to the cage. The operator on the ground must always wear the helmet.

Always ensure that no persons or animals are found in the range of action of the EWP before starting any operation.

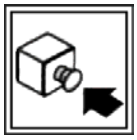
Pay attention to not drop any object or equipment from the cage.

Use the machine only in open spaces. In the event operations must be carried out indoors (tunnels, buildings, etc.), there is the risk of carbon monoxide poisoning due to the discharge gases of the vehicle.

never climb or get down from the EWP when lifted.



never unload or load objects from the EWP when lifted. Loading the cage with materials or objects when it is already in height is prohibited.



in case of danger, press the emergency stop button.

do not set the EWP to rest by staying in the cage.

do not press with the EWP cage to the ground.

Therefore, using the EWP with capacities exceeding that indicated in the identification plate is prohibited.

SAFETY STANDARDS TO COMPLY WITH DURING MAINTENANCE:

All maintenance operations not indicated in the manual must be carried out by authorized personnel in workshops authorized by the manufacturer.

Press the emergency button and turn off the motor before proceeding with maintenance. Take care of the environment: avoid oil leakage while topping up or replacements.

The used oils must be disposed of according to the standards in force.

never introduce the body, limbs, or fingers inside the articulated, cutting openings of the machine, which are not monitored and without suitable guards, unless they are safely blocked.

never use fuel, solvents or other flammable liquids, such as detergents: use instead authorized, non-flammable and non-toxic marketed solvents.

Use compressed air to clean the components, protecting yourself with goggles with side shields and limiting pressure at maximum 2 atm. (1.9 bar).

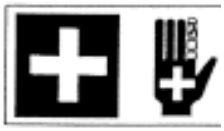
do not use open flames to illuminate when proceeding with maintenance operations.

before disassembling the fittings or piping, ensure that there are no fluids under pressure: the oil that exits under pressure can cause serious injuries.

Immediately contact a doctor in the event of injuries or if fluids exiting from the pipes are swollen accidentally.

In particular, remember that the fluid under pressure that leaks from a very small hole can be almost invisible, but have sufficient force to penetrate into the skin.

To detect leakages, use a carton or a piece of wood that clearly detects the liquid.



Immediately contact a doctor in the event the fluid contacts the skin, as a non-immediate medical treatment may cause serious infections or skin diseases.

<u>Comply to the safety standards and ensure others do the same.</u>

2.2.1. SAFE DISTANCE FROM SLOPES AND DITCHES

Always position the EWP at a safe distance from slopes and ditches that are not highlighted.

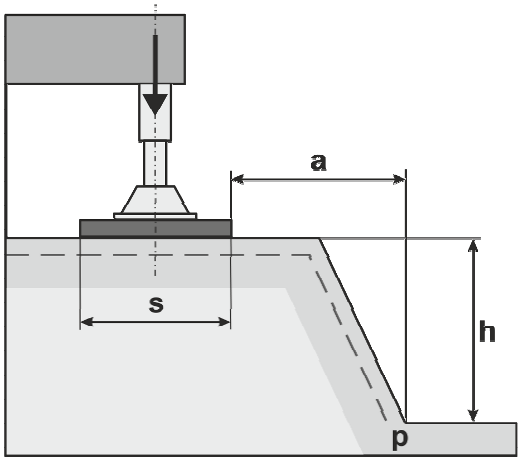


fig. 2.2.1

The safe distance depends on the type of ground where the machine is positioned, which must be flat and compact.
Commonly, the following empiric rule is followed:
- in the event ground is compact but used for filling, safety distance (a) must be doubled compared to the depth of the ditch (h):

$$a = 2h$$

- in the event ground is compact, solid and coherent, safety distance (a) must be equal to the depth of the ditch (h):

$$a = h$$

The safe distance is measured from the foot (ft) of the ditch.
The supporting surface (s) varies depending on the type of ground (see. tab.1 and 2).
The ground where the EWP must be positioned must support the weight of the machine at full load..

Before positioning the EWP, ask the supervisor (work director, worksite assistant, etc.) if cavities, pipelines, wells, old tanks, floors of basements, manures, etc. can be hidden under the outriggers.

Depending on its geomorphological characteristics, the ground can support higher or lower surface pressures. Table 1 indicates which is the surface pressure allowed under the EWP outriggers.

tab.1

Type of ground, geomorphological characteristics		***Surface pressure allowed***	
		kg/cm²	***lb/in²***
Loose ground, not compact		***Generally not solid; requires special reliefs***	
Muddy, mushy, peat ground			
Coherent, soft ground			
Incoherent, compact ground, sand, gravel		***2.0***	***28.4***
Coherent ground	***Solid***	***1.0***	***14.2***
	Half-solid	***2.0***	***28.4***
	Hard	***4.0***	***56.9***
Rock, concrete, road pavement suitable for the transit of heavy vehicles		***Over 10.0***	***Over 142***

tab.2

MAXIMUM BEARING CAPACITY	***SURFACE PRESSURE ALLOWED (see tab.1)***		
	1 kg/cm² 14.2 lb/in²	***2 kg/cm² 28.4 lb/in²***	***4 kg/cm² 56.9 lb/in²***
	Overall supporting surface required		
10t	***3.3 x 3.3 ft 1.0 x 1.0 m***	***2.3 x 2.3 ft 0.7 x 0.7 m***	***1.65 x 1.65 ft 0.5 x 0.5 m***

2.2.2. WARNINGS FOR OPERATIONS CARRIED OUT CLOSE TO ELECTRIC LINES

Working with an aerial platform close to electric lines is always extremely dangerous, due to the natural mobility and versatility of the machine.

Remember that electric discharges occur also if two bodies do not touch but it is sufficient to not respect the safety distance.

In Italy the Presidential Decree 164 art. 11 indicates a minimum distance of 16.4 feet (5 m) for any voltage value.

This value is minimum and involves all parts of the machine and equipment during operation. Besides complying with the minimum distance allowed, prescribed by law, we recommend a series of measures to take to reduce the risk of accidents.

Ask the Electric Company to interrupt the supply of power and ground the line. This solution is the most effective and often less annoying. When power supply cannot be disconnected, keep all the

parts of the machine and load at a distance greater than 16.4 feet (5 m); considering that the lines can oscillate due to wind.

Persons not required for the operations must stay as far as possible from the workspace. Set-up so to allow a supervisor equipped with buzzer to monitor the operations and immediately inform about the danger of electric discharges when the operation gets too close to the electric line. Operate cautiously with slow movements. Use suitable personal protective equipment, such as: insulation of the EWP machine, line proximity device, (consider that if the contact occurs outside the covered zone of the sensors, there will not be any alarm triggered), movement reducer, etc. Consider that humidity, dirt and oil can reduce the insulation power of the device and that only what is under the insulation is protected.

The apparatus grounding offers little or no protection against electric discharge risks.

Operating close to radio and television stations, the EWP can receive an induced high voltage. Take suitable measures in advance referring to the authorized technicians.

- **It is prohibited** using the platform (EWP) with flammable or explosive atmosphere.
- **It is prohibited** using the machine when it rains or snows.
- **It is prohibited** pulling or pushing horizontally or sideways with the platform.
- **It is prohibited** using the machine with a load exceeding that allowed on board of the platform (persons + equipment).
- **It is prohibited** using the platform in presence of wind with speed exceeding the maximum value allowed (see Para 6.3).
- **It is prohibited** placing billboards and similar on the platform, as they increase the wind load on the platform.
- **It is prohibited** controlling the platform translation from the ground by walking close to it.
- **It is prohibited** controlling the machine from the ground with the operator on board of the work platform, unless for emergencies.
- **It is prohibited** circulating with the machine on roads, as it is not certified for this purpose.
- **It is prohibited** resting any part of the platform on other fixed or mobile structure, when working.
- **It is prohibited** using the machine with the electric engine when it rains, snows on high and wet grass or with a high level of humidity.
- **It is prohibited** using the work platform of electric tools when it rains, snows or with a high level of humidity.
- **It is prohibited** using the platform with electric engine and/or electric tools without the ground plate connected to the machine structure.
- **It is prohibited** over-loading the work platform when at height, in order to prevent the machine from tilting.
- **It is prohibited** climbing on the railing of the work platform to reach the highest levels.
- **It is prohibited** entering or exiting from the work platform when it is lifted.
- **It is prohibited** using the platform (EWP) with failed safety devices and/or with missing protection devices.
- **It is prohibited** using the machine without wearing the helmet, the safety belt and personal protective equipment.
- **It is prohibited** performing any modification on the platform (drilling, welding).
- **It is prohibited** increasing the height or outreach of the work platform (EWP) with additional means (e.g. ladders).
- **It is prohibited** using the platform close to high voltage electric lines.
- **It is prohibited** using the platform as a crane.

fig. 2.2.2.1

2.3. OPERATING ENVIRONMENTAL LIMITS

The machine runs normally with the following environmental conditions:
- minimum temperature: 23 °F (-5 °C)
- minimum temperature: +104 °F (40 °C)
- humidity: 80% at 104 °F (80% at 40 °C)
- wind speed: lower than 28 mph (12.5 m/s) (Beaufort scale, see Para 2.3.2).
- altitude above mean sea level: 5000 ft (1500 m).

Maximum inclination of the ground during the drive:
- in the drive direction: 10°
- sideways compared to the drive direction: 4°.

Attention:
in presence of snow and/or ice, those slopes must be halved.

2.3.1. ILLUMINATION

The machine is not illuminated.

For operations carried out with poor light, the user must provide the involved zone with artificial illumination, complying with the standards in force in the country where the machine is used.

The light must be such to allow identifying with absolute certainty:
- emergency devices;
- warning and danger plates;
- control plates;

Illumination must never create annoying or dangerous optical effects.

2.3.2. BEAUFORT SCALE

Wind force		Wind speed*		Wind effect in the internal zone
	Descript.	mph	Km/h	
0	Calm	0	<1	Calm, smoke rises vertically.
1	Light air	1 ÷ 3	1 ÷ 5	Smoke drift indicates wind direction. Leaves and wind vanes are stationary.
2	Light breeze	4 ÷ 7	6 ÷ 11	Wind felt on exposed skin. Leaves rustle. Wind vanes begin to move.
3	Gentle breeze	8 ÷ 12	12 ÷ 19	Leaves and small twigs constantly moving, light flags extended.
4	Moderate breeze	13 ÷ 18	20 ÷ 28	Dust and loose paper raised. Small branches begin to move.
5	Fresh breeze	19 ÷ 24	29 ÷ 38	Branches of a moderate size move. Small trees in leaf begin to sway. Small amounts of spray are formed in the lakes.
6	Strong breeze	25 ÷ 31	39 ÷ 49	Large branches in motion. Umbrella use becomes difficult. Whistling heard in overhead wires.
7	Near gale	32 ÷ 38	50 ÷ 61	Whole trees in motion. Effort needed to walk against the wind.
8	Gale	39 ÷ 46	62 ÷ 74	Some twigs broken from trees. Progress on foot is seriously impeded.
9	Strong gale	47 ÷ 54	75 ÷ 88	Houses are slightly damaged. Throws down chimney lids and tiles.
10	Whole gale	55 ÷ 63	89 ÷ 102	Widespread damage to vegetation. Many roofing surfaces are damaged.
11	Severe storm	64 ÷ 73	103 ÷ 117	Widespread damage.
12	Hurricane	73	118	Hurricane Devastation

*** wind speed measured at 33ft (10m) above a flat surface.**

All the EWP (except those specifically designed for indoor use) are designed to operate up to the maximum wind speed indicated in the machine and on the instruction manual of the manufacturer.

Operating with a wind speed exceeding that indicated can cause instability.

The wind speed generally accepted, according to which the machine has been designed, is 28 mph (12.5 m/s). This is also the maximum speed that allows the operator to work comfortably.

The speed can be measured from the platform by using a manual digital anemometer or, more empirically, estimating it with the use of the Beaufort wind force scale.

We also recommend using an instrument to measure the wind speed to be taken in height, to prevent excessive oscillations due to wind and, therefore, danger of tilting over.

In the event of wind and gusts, do not use the EWP.

It is important to know that the wind speed increases the highest you are from the ground; it can also be 50% stronger at 66 ft (20 m) compared to the ground level.

The wind cooling factor. In a calm day with temperature at 50 °F (10 °C), the weather is fresh but still warm. With 20 mph (32 km/h) wind speed, the perceived temperature on face and hands is 32 °F (0 °C). Therefore, wear warm clothes before starting the operations, even if temperature on the ground seems to be warm (if temperature is 32 °F / 0 °C, that perceived is 5 °F / -15 °C !).

Special attention must be taken when façade coatings are transported, as well as windows, panels and other similar materials that can act as a "sail" and seriously compromise the machine stability, especially in presence of gusts of wind. For the same reason, billboards and similar must not be affixed on the work platform, even if only temporary.

Moreover, the shelter and funneling effect of high or close buildings must be known and predicted, as it can increase the wind speed in days where the speed of the wind in open zones is low.

2.4. OPERATOR'S WORKSTATION

The operator can control the machine inside the work platform (cage); if the EWP is controlled externally, he must always keep at a safe distance, outside the dangerous zone.

2.5. DANGEROUS ZONE

The dangerous zone corresponds to the workspace in the condition of maximum horizontal outreach of the platform.

Keep at least **33ft** / **10m** away from the machine turret.

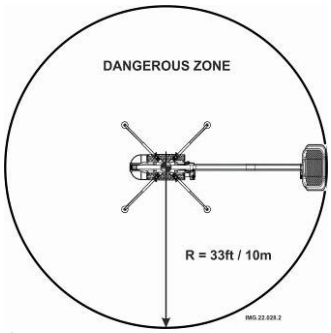


fig. 2.5.1

2.6. RESIDUAL RISKS

These risks cannot be fully reduced during the designing phase and with protection techniques, so they are non-evident potential hazards.

Pay attention to the following residual risks that can occur when using the machine and that cannot be removed.

Dangerous movements

Persons different from the operator cannot stay around the machine. Otherwise, immediately stop the movements and oblige them to move away.

Electrical risks due to live parts and residue voltages.

Operations on the machine main electrical panel must be carried out only by skilled personnel and always with the power supply disconnected.

Danger of mechanical nature.

Contact with the machine articulated components, such as:
- outriggers;
- column;
- arms;

can be cause of crushing and shearing of the limbs.

Danger of thermal nature
- Contact with hydraulic pumps can cause burns.
- Contact with the internal combustion or electric engines can cause burns.
- Contact with components of the hydraulic system can cause burns.

Further residual risks, according to the experience gained:
- danger due to an imperfect control of the trajectory by the operator,
- danger due to protruding parts of the machine,
- danger due to moving parts,
- danger due to instability,
- danger of crushing.

2.7. USE OF PERSONAL PROTECTIVE EQUIPMENT

The operator on the work platform must wear the helmet and fasten the safety belt, which is secured to the platform.

Even the operator at the base of the platform (EWP) must wear the helmet.

Moreover, wear specific protective clothes for the operation to carry out; for thispurpose, refer to the employee or safety manager.

2.8. SAFETY DEVICES

ATTENTION:
- **Do not tamper with the safety devices and plates, as well as the protective guards, in any case.**
- **Before using the machine, ensure that these are installed and efficient, otherwise inform the maintenance manager**

The following safety devices are installed on the machine:

- Emergency stop on all the control stations, which turns off the truck or the hydraulic supply source.
- Hydraulically controlled block valves on all the cylinders
- Mechanical stop devices of the outriggers
- Arm lock in drive position
- Automatic leveling of the platform
- Verification of the platform automatic leveling system failure, turning off the motor of the hydraulic supply source.
- Arm maneuver consent automatic device with the machine properly stabilized on the ground.
- Control automatic system of the outrigger outlet.
- Control automatic device of the platform tilting movement.
- Control automatic device of the platform load.
- Recovery manual pump in emergency.
- Emergency manual devices of the emergency recovery controls.
- Emergency manual devices on all the control solenoid valves.

2.8.1. SAFETY DEVICES

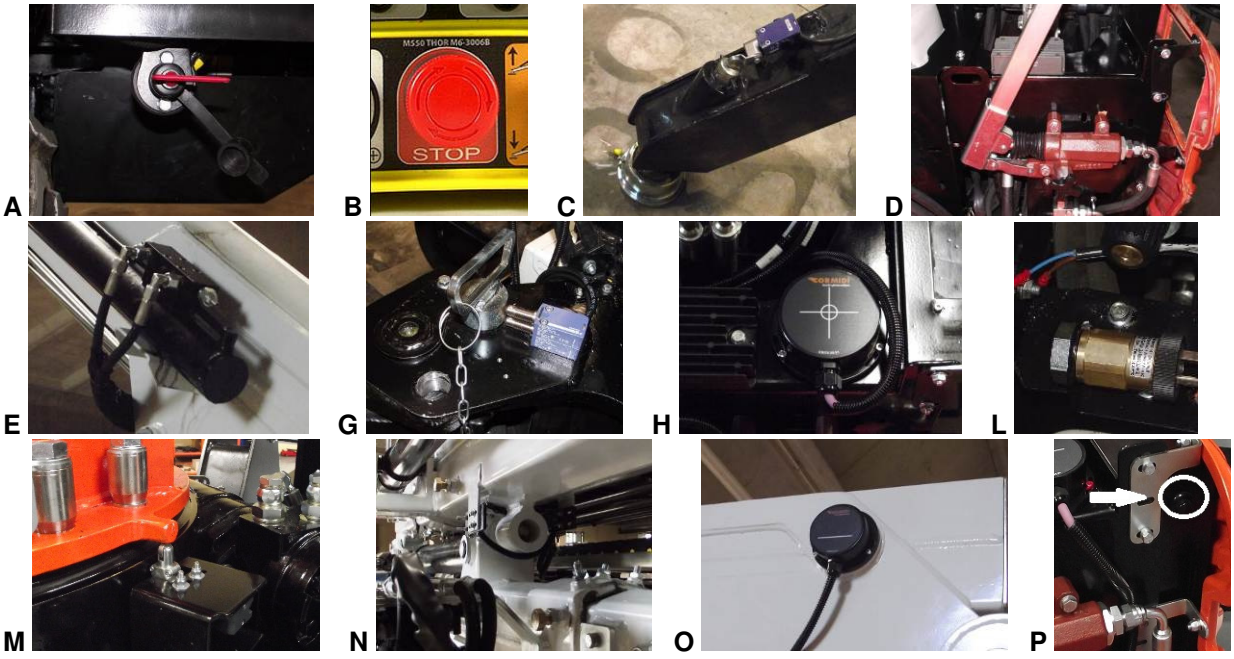


fig. 2.8.1.1

- Key of the safety devices:

A - Battery cut-off switch
Stops the electric circuit and blocks the machine operation; it is placed at the bottom left of the motor bonnet.

B - Emergency stop button
Red mushroom button. Press the button to immediately stop all the machine movements.
Rotate the button clock-wise to restart the machine.

D - Emergency manual pump
If controlled according to the descend procedure in emergency mode, it allows recovering the work platform by the personnel on board and allows setting aside the machine.

E - Block valves
Are placed in every hydraulic jack. Block the movement of the jack in the event the supply pipe breaks or should the oil supply lack, to prevent the work platform to fall to the ground.

G – Double detection device of the outriggers pins.
Prevents the operation of the machine if not correctly inserted.

H – Electronic level for the machine planarity.
Detects the planarity of the machine.

L – Temperature sensor
Indicates the motor over-heating.

M – Alignment detection device of the turret
Consisting in a micro switch that detects the position of the arm when it is aligned to the longitudinal axis of the machine.

N – Closing locking mechanical device of the secondary arm.

O – Inclination detection electronic device.
Prevents using the machine if it is not stabilized within a set maximum value (see technical data). A buzzer activates in the event such a limit is exceeded.

P – Control Button for Emergency Start.
When pressed the button allows to start the internal combustion engine in case of emergency due to the absence or malfunction of the remote control or the receiver unit.

2.9. WARNINGS, PROHIBITION AND DANGER

PROHIBITION: removing the safety labels and plates of the machine is strictly prohibited: Immediately replace those worn and/or illegible.

CAREFULLY READ: During the designing phase, it has been made everything possible to prevent any risks: where this was not technically possible, we have used specific pictograms to highlight the potential and imminent risks. Special labels with indications and descriptions are associated to the pictograms to highlight the possible danger, according to standard UNI 9244-95 (E).

ATTENTION: Comply with the warnings of the plates; failure to comply with them can cause serious injuries or death.
Ensure that the plates are always legible, otherwise replace them.

The following figure describes the position of the safety plates on the machine.

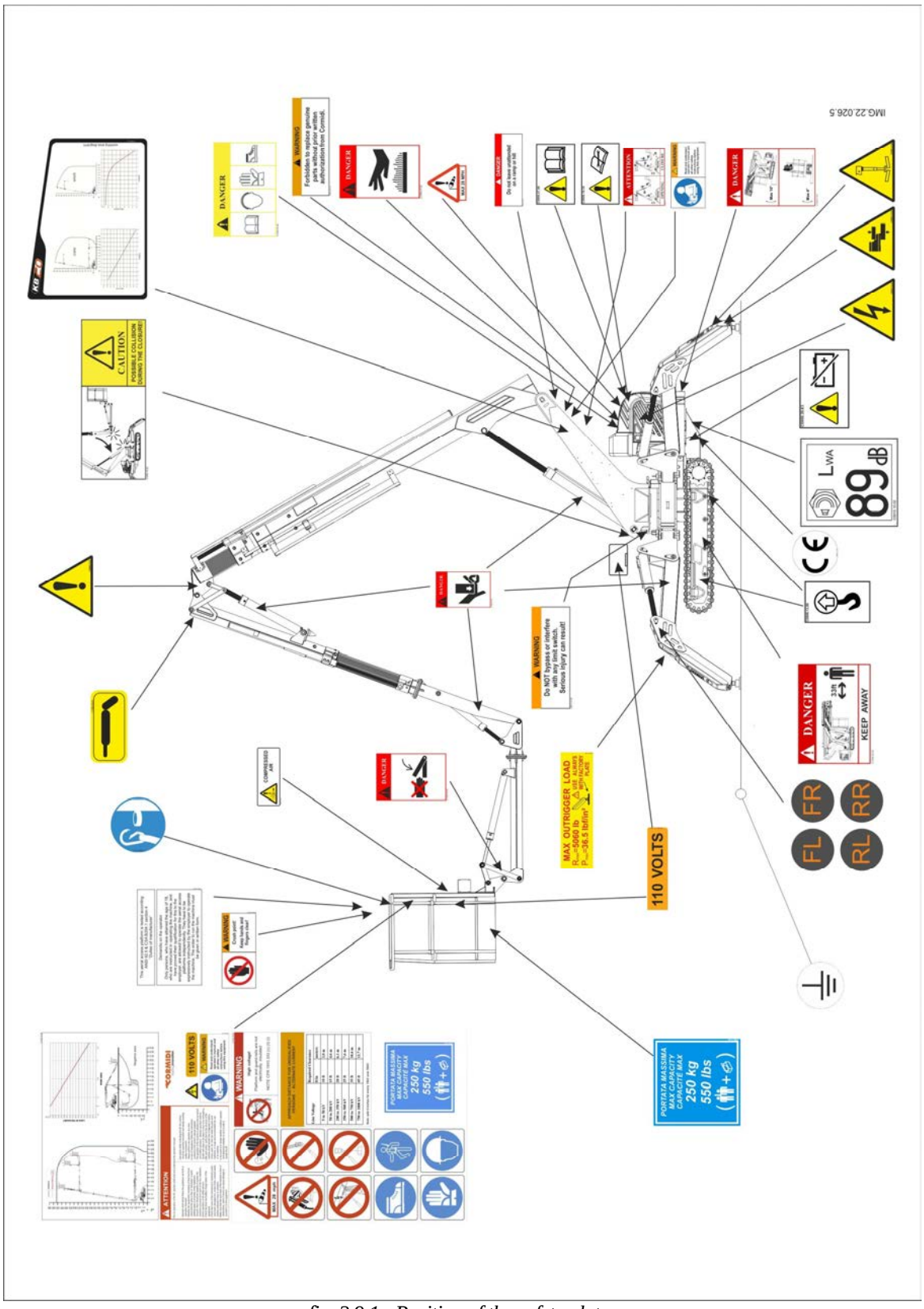


fig. 2.9.1 - Position of the safety plates

2.9.1. PLATES INDICATING WARNING, PROHIBITION AND DANGER IN THE CAGE

fig. 2.9.1

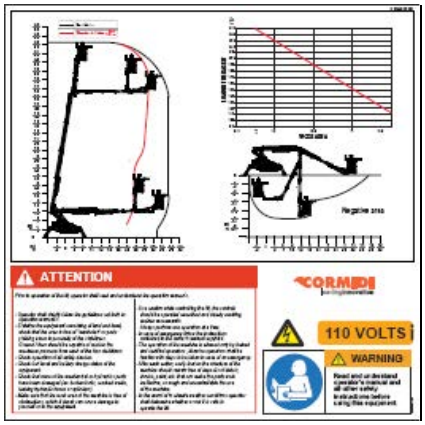


fig 2.9.2

fig 2.9.3

2.9.2. ACOUSTIC SIGNALS

The figures below indicate the positions of the buzzers.

fig. 2.9.2.1

The buzzer is active when the machine is not stabilized and/or when is moving.

If the machine is stabilized, it is activated when the maximum load allowed in the work platform is exceeded.

The buzzers of the acoustic indicators are placed on the turret and on the remote control front (see fig. 2.9.2.1).

3. INSTALLATION

3.1. STORAGE

Should the machine be inactive for a long period, it must be stored indoors, protected against weather agents and covered with a canvas.

- These environments must not be excessively humid and dusty.
- Avoid all the ambient conditions that can affect the platform (EWP) operation over time.
- Do not expose the rubber tracks to sunlight for more than three months.
- Grease the non-painted parts;
- Protect the machine against humidity and high differences in temperature;
- Protect the machine against corrosive substances.

The ambient temperature must be within -4 °F and 122 °F (-20 °C and +50 °C).

3.2. HANDLING THE MACHINE

The machine must be handled by an authorized operator for using lifting devices and handling materials and machines (strictly following the instructions of the manufacturer), complying with the standards in force of the country where the machine is installed.

- The machine can be displaced by using a normal mean of transport, suitable for transporting loads, and same weight and dimensions of the machine (see technical documentation of the mean);
- The machine can be lifted using a forklift or on the transport deck by means of ramps.
- Always verify the correct balance of the machine weight when it is transported with a forklift, in order to prevent unexpected displacements or accidental falls of the machine.
- We recommend to always use means suitable for supporting the machine dimensions (see technical sheet), in order to prevent, the machine, persons or objects from being damaged.

3.2.1. LIFTING THE MACHINE

DANGER:
- Lift the machine using a crane with greater capacity compared to that of the platform (EWP) mass (see § 4.2 "Technical data").
- Use intact strips, ropes, chains and hooks, with EC approval and suitable capacity for the load to be lifted (see technical data).
- Harness the machine as indicated in fig. 3.2.1.1
- Once this operation has been completed, the operator must move away from the machine.
- Wear gloves to handle ropes and hooks.

Lift the machine by placing the harness in the points indicated by the plates fig.3.2.1.3 on the machine, excluding those indicated in the plates fig.3.2.1.3 *(cod. C0900.13.68)*, as shown on the side and in the figure below.

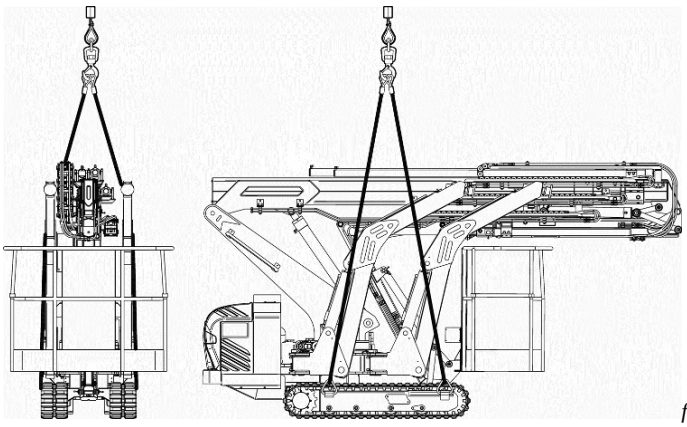


fig 3.2.1.1

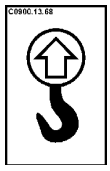


fig. 3.2.1.2

fig. 3.2.1.3

3.2.2. LOAD AND UNLOAD THE MACHINE ON AND FROM THE TRANSPORT MEAN

DANGER:
- **Pull the handbrake of the transport mean, to prevent it from moving.**
- **Use access ramps with suitable dimension and capacity.**
- **The length of the ramps must ensure a maximum slope of 10°.**
- **Ensure that the ramps are blocked to the load deck with the safety pins.**
- **Accurately clean the ramps and loading platform from dirt, oil, mud, snow and ice.**
- **Ensure that no one stands or transit in the involved zone of the loading operations.**
- **Close the platform, fully lift and close the outriggers.**
- **When ascending, the operator in charge must not perform sudden rotations with the tracked carriage on the ramps.**
- **Always activate the controls gradually and smoothly, carrying out one movement at a time.**

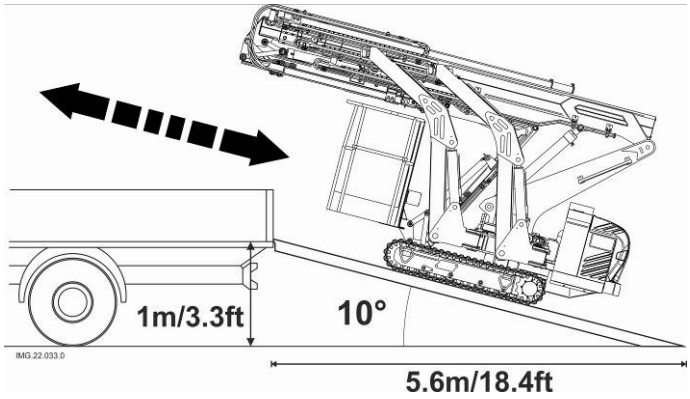


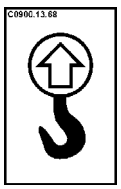
fig. 3.2.2.1

3.2.3. TRANSPORTING THE MACHINE

DANGER:
- **During transport, pay attention to the road signs that indicate height limitations-**
- **In the event the platform (EWP) protrudes from the transport mean rear, always use the specific sign to indicate protruding loads.**

The displacement of the machine from a worksite to the other, is always a source of danger.

The machine must be secured to the vehicle platform by means of EC approved ropes and tie rods, always connected to the points indicated on the plates, and making them pass on the front and rear of the main arm. These ropes and tie rods are also used for lifting the machine fig. 3.2.1.1.



3.3. CLEANING THE MACHINE

DANGER:
- **Do not wash or clean the machine if it is connected directed power.**
- **Do not use a pressure washer on any electrical components to prevent damaging them.**

Never use fuel, solvents or other flammable liquids, such as detergents. Use authorized, non-toxic marketed solvents.

When cleaning, be equipped with personal protective equipment (protective clothes, gloves, goggle, etc.).

Dispose of the washing residues according to the standards in force.

We recommend using compressed air (better if hot) to dry all the components, keeping the jet at least 1ft / 30cm away from the surface to be dried.

4. DESCRIPTION OF THE MACHINE

The KB23-13 machine is a lifting hydraulic machine that allows one or two operators to reach suitable workstations in the workspace.

Also called EWP (elevating work platform), the machine develops vertically and its maximum capacity is 200 Kg (441lb) or 250kg (550lb), depending on the version.

The machine, is installed on a self-propelled crawler, intended for access and aerial work, in places where a trucked machine cannot be used (churches, museums, theatres, etc.); it is also suitable for areas with low concentrated specific capacity (such as floors of garages or basements).

4.1. MAIN COMPONENTS

The elevating work platform (EWP) consists essentially of:

Undercarriage

Made with electro-welded shaped steel sheets, the undercarriage is equipped with tracks with rubber tread with a large supporting base, hydraulically activated; the four stabilizing crossbeams are fasten to the undercarriage.

The platform rack rotation unit is secured to the upper part of the undercarriage.

Outriggers

The outriggers ensure sufficient stability of the machine during the several work phases.

Each outrigger is fastened to a hydraulic cylinder equipped with block valve and safety sensor on the supporting foot.

Turret

Made with electro welded shaped steel sheets, the rotating turret is supported by lubricated sliding bushings inside the swivel base hub.

The main arm is hinged to the end of the column, while the lifting cylinder of the main arm is hinged to the base of the column.

Main arm

Made with electro welded shaped steel sheets with rectangular sections, it is activated by the main arm lifting cylinder equipped with block valve.

Retraction arms

Made with electro-welded steel sheets with rectangular sections, they are activated by two hydraulic cylinders with double effect, called "retraction arm cylinder", equipped with an hydraulically controlled block valve and connected my means of steel rigid piping.

Self-lubricating runners are installed inside the main arm and retraction arms.

Joint

An hydraulic articulation is applied at the end of the last retraction arm, which is called "joint". This is made with electro-welded shaped steel profiles with rectangular section.

The joint is activated by a connecting rod-cylinder system with 180° rotation.

The hydraulic cylinder of the joint has a double effect and is equipped with double hydraulically controlled valve.

Work platform arm

A steel plate bearing the insulation unit is installed at the end of the joint. The steel plate consists in a plate made with insulated materials and insulated bushes containing 4 high-resistant steel screws.

The screws and self-locking nuts fasten the plate, found at the end of the joint retraction arm, to a second steel plate, installed on the bearing arm of the work platform.

The platform arm is made with electro-welded shaped steel sheets.

Work platform leveling unit

The leveling system is activated by a specific cylinder with double effect, equipped with a hydraulically controlled blocking valve.

The leveling cylinder activation is controlled by a proportional directional solenoid valve, which is activated by an automatic leveling electronic system installed on the work platform.

Work platform (cage)

The work platform is made with electro-welded shaped aluminium tubular with side opening for the access of the operator. it is equipped with "self-knockdown" closing bar.

The cage has one or two fittings for the safety belts, depending on the type of cage, an electric socket for the tools and a connector for the remote control.

Electro-pump

The electro-pump is used as propeller for the aerial part of the platform, indoors, where the combustion motor cannot be used as it emits harmful carbon monoxide.

4.1.1. MATERIAL SUPPLIED WITH THE MACHINE

– Safety belts
– Safety ropes
– Remote control
– Manuals
– Certifications

4.2. MAIN PARTS

4.2.1. MAIN PARTS OF UNDERCARRIAGE

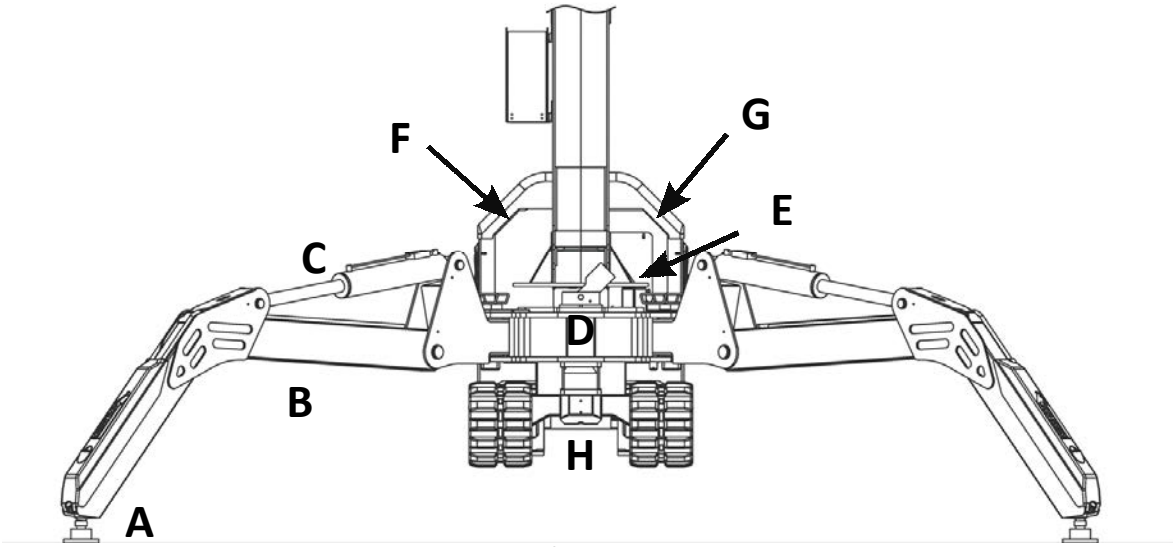


fig. 4.2.1.1

- Key of the main parts of the base carriage:

A - Supporting foot
B - Stabilizing arm
C - Stabilizing jack
D - Frame
E - Roller bearing unit
F - Hydraulic oil tank
G- Motor
H- Crawler

4.2.2. MAIN COMPONENTS OF THE AERIAL PART

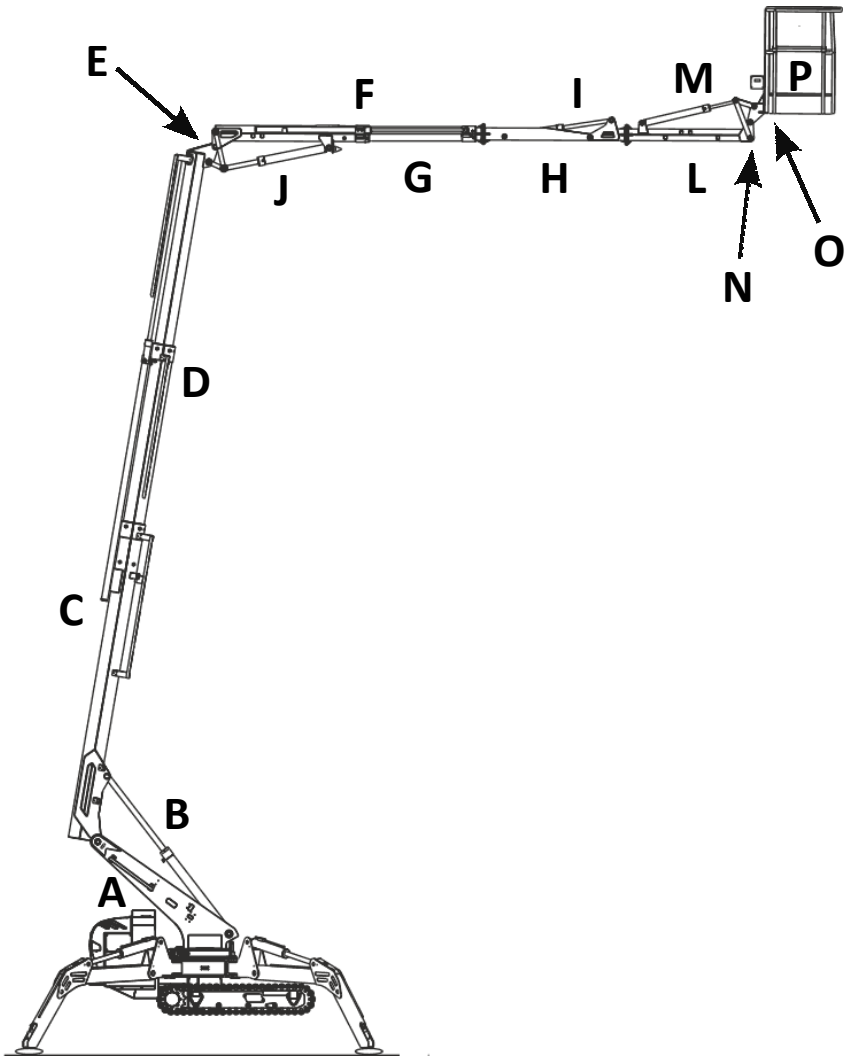


fig. 4.2.2.1

- Key of the main components of the aerial part:

A – Turret
B – Main arm P&T jack
C – Main arm
D – Main retraction arm
E – Joint
F – Secondary arm - Jib
G – Jib retraction arm
H – Plus
I – Jack Plus
J – Jack Jib
L – Cage arm
M – Cage automatic leveling jack
N – Work platform joint
O – Work platform support
P – Work platform (cage)

4.3. OVERALL DIMENSIONS

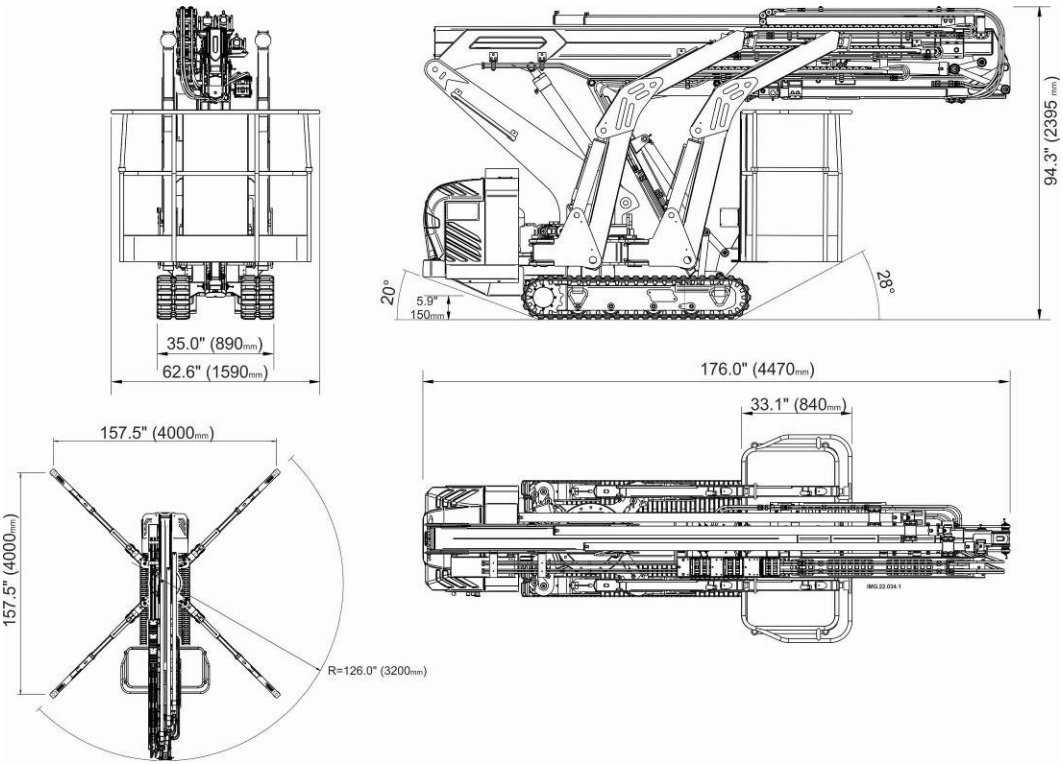


fig. 4.3.1

4.4. ENVIRONMENTAL CONDITIONS

Allowed temperatures from 41 °F to 104 °F (5 °C to 40 °C) with 50% of maximum humidity at 104 °F (40 °C) or maximum 90% at 68 °F (20 °C).

Attention, the machine is not suitable for uses in flammable or explosive atmosphere, corrosive environments with excessive dust. Moreover, it is not suitable for use at a height exceeding 5000ft (1500m) a.m.s.l.

4.5. ILLUMINATION

The worksite illumination must comply with the laws in force in the country where the machine is installed and must ensure a good visibility in every point, without creating dangerous reflections and allowing a clear reading of the control panels and detecting the emergency button.

As the machine is supplied without illumination devices, the workspace must be provided with suitable illumination such to ensure values within 200 and 300 lux in every point of the machine.

4.6. VIBRATIONS

In conditions of use in compliance with the indications, vibrations are not such to arise dangerous situations.

The vibrations transmitted to the operator in the platform are not significant.

4.7. SOUND EMISSIONS

The equivalent continuous A-weighted sound pressure level and the C-weighted instantaneous acoustic pressure in the workspaces is not such to arise dangerous situations for the operators.

Other sound level measurements in the workspace must be carried out in accordance with that indicated by the laws in force in the country of use.

The measurements carried out indicate the following levels:

Equivalent continuous A-weighted sound pressure level	**LpA =**	**88 dB(A)**
Equivalent continuous A-weighted sound power level (ensured)	**LwA =**	**89 dB(A)**

With motor HONDA iGX440

tab. 4.7.1

LpA - is the maximum level ensured of equivalent continuous A-weighted sound pressure close to the sound emission source.
LwA - is the power level ensured in compliance with that indicated in the European directive 000/14/EC and national implementing decrees.

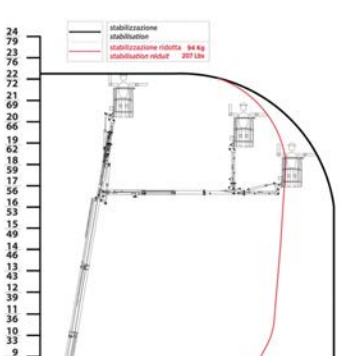
4.8. GAS EMISSION

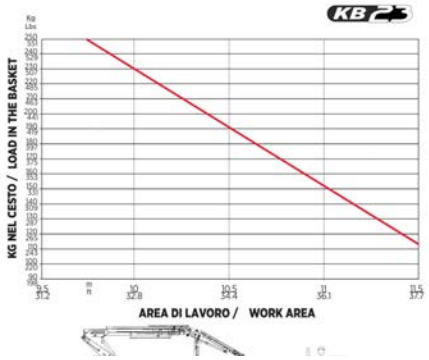
- Gases produced by the combustion of fuel used by the internal combustion engine.
- Fuel vapors developed during the refueling phase.
- Hydrogen developed by the battery for starting the internal combustion engine.

4.9. SPECIFICATIONS

Maximum permissible load	250 kg / *550 lb*	850 kg/*1874 lb* crane config.
Max nr. of Operators	2	
Max outreach on the cage	11 m / *36 ft*	
Arm up work zone (80 kg / *176.4 lb*)	11,75 m / *38,5 ft* (± 5%)	
Arm up work zone (200 kg / *441 lb*)	10,3 m / *33,8 ft* (± 5%)	
Arm up work zone (250 kg / *551 lb*)	9,7 m / *31,8 ft* (± 5%)	
Turret rotation	365° non continuous	
Development up to platform height cage	20 m / *65.6 ft*	
Max working height	22.3 m / *73,1 ft*	
Weight without operator	3385kg / *7462 lb* (± 2%)	3163 kg / *6973 lb* conf. gru (± 2%)
Platform leveling	electronically controlled hydraulics	
Work arm	with hydraulic extension	
Controls	proportional hydraulics electronically controlled	
Oil tank capacity	35 lt	
Pumps:	3 pumps with gearboxes	
System pressure	240 bar	
Maximum gradient	10° in the driving plane	
Max wind speed	28mph (12.5 m/sec)	
Electric system voltage	12 V	
Max horizontal load	50 daN	
Maneuvering speed	0.72 m/sec / *1.61mph*	
Maximum tilt frame admitted	1°	
Traction	crawler tracks with negative pressure holding brakes	
Max offset speed	3.1 km/h / *1.93mph*	
Outriggers	with electronic control	
With Internal combustion engine	Honda iGX 440 with electronic control	
With Electro-pump	V 120 Hz 60 2.2 kw	

4.9.1. DIAGRAM WORKING AREA





4.10. TOOLS

To be used only in case of EMERGENCY:

1) manual hydraulic oil pump;

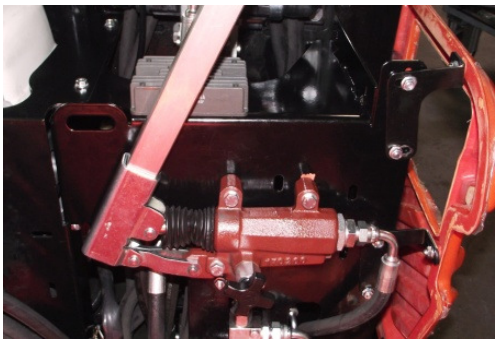


fig.4.10.1

2) button to enable the engine of the machine for emergency operation;

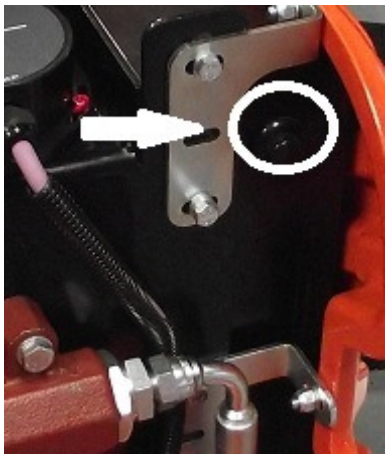


fig.4.10.2

3) valve manual controls for enabling the machine emergency operation;

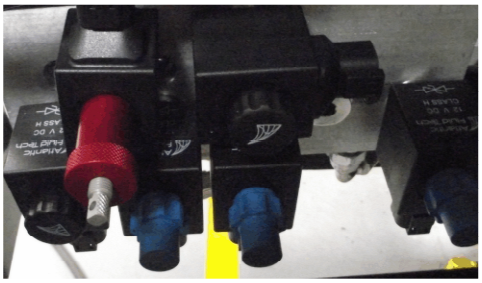


fig.4.10.3

4) manual controls for activating the tracks;

fig.4.10.4

5) manual controls for activating the outriggers;

fig.4.10.5

6) manual controls for activating the aerial part;

fig.4.10.6

4.11. PANELS AND MANAGEMENT UNIT

MIS – Remote control

fig. 4.11.1

MIS continuously interacts with the machine. The large and luminous LCD display shows the machine functional parameters (from the lifted load to the machine inclination grade during the towing phase) and other functions and parameters or any operation errors.

At this point, the key customization code can be added combining it with a specific name.

MSS – Master unit- Operation electronic panel

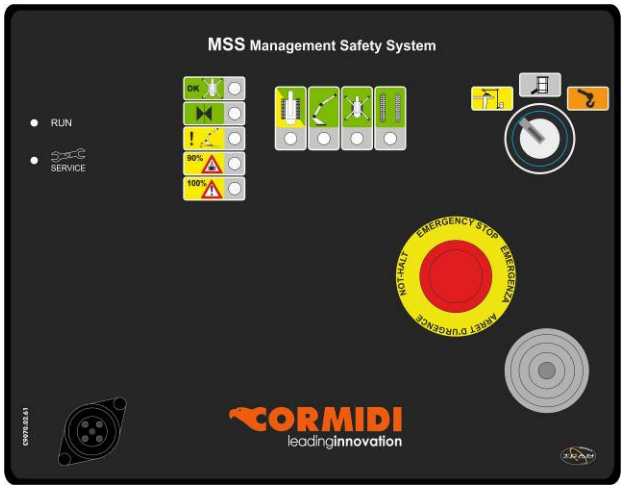


fig. 4.11.2

Master unit – MSS Management Safety System.

It is a powerful electronic software with a double control system that perfectly manages all the important and safety functions of the machine.

It is also a powerful black box used to save the anomalies and way of use of the machine, if it is coupled with the localization **IPS-one** device (upon request).

MLS – Cage self-leveling unit

It is a powerful management unit of the work platform, which allows keeping the work cage always horizontal; the self-leveling function is always active (see fig. 4.11.3).

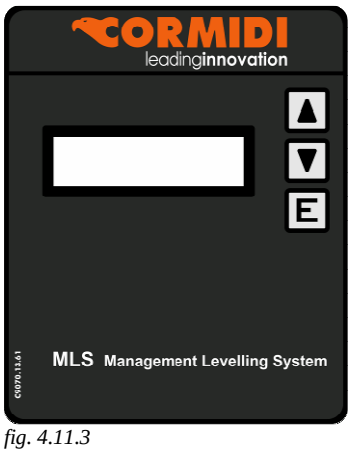


fig. 4.11.3

IPS-one (Information Position and Service)

IPSone is an additional unit (supplied upon request), which allows the machine to interact directly with the manufacturer and with the machine's owner continuously. From your desk, you can comfortably know the position of the machine and any related alarms or errors.

EMS – Motor control unit

This system selects the best speed possible depending on the control used, optimizing the speed to have a fluid and safe drive as well as a considerable saving in terms of fuel.

If no control is activated for 10 seconds, the system sets the motor to the minimum, to save fuel; as soon as the control is activated, the motor is automatically set at the optimal speed; if the pause lasts more than 20 seconds, the motor turns off.

SSF – Computerized stabilization and destabilization

SSF is a powerful algorithm, which allows stabilizing and destabilizing the machine fully automatically, with an extreme precision, the order of 0.5 grade level.

By pressing one single button, the position machine stabilizes or destabilized in less than 5 seconds autonomously.

Twin Speed

The drive is equipped with a system with 3 hydraulic pumps to allow the machine to have two offset speeds, which can be selected from the remote control.

4.12. STANDARD SUPPLY

The machine is delivered ready for commissioning. It is equipped with:

- Use and maintenance instructions.
- Plate with CE marking.
- Certifications.

4.13. ELECTROMAGNETIC ENVIRONMENT

All the machine components comply with Directive 2004/108/EC (and subsequent amendments) on the electromagnetic compatibility.

The machine is manufactured to operate properly in an industrial electromagnetic environment, within the Emissions and Immunity limits indicated by the following harmonized Standards.

- IEC EN 61000-6-2 - Electromagnetic compatibility (EMC)
- General Standards - Immunity for industrial environments (2006).

5. USE OF THE MACHINE

Start-up of the EWP

The elevating work platform must be used only by qualified and trained personnel, who has been enabled to operate with such work equipment.

Before use

- Visually inspect the entire machine and ensure that there are no persons or materials that can obstruct the regular operation or objects left on it.
- Carry out the daily inspections as indicated in the chapter on maintenance.
- Wear approved accident-prevention clothes.
- Ensure that all the operators have been informed on the use and maintenance rules.
- Fasten the safety belts in the cage.
- Close the access protection device to the platform.
- Ensure that all the controls and safety devices are efficient.
- Ensure that the cage is equipped with a rope that allows descending with hooks in case of emergency.

During use

- Pay attention when moving, properly assess any obstacle.
- Avoid any collision of the platform or arms with the truck cabin or other parts of the machine.
- Pay attention to the safety standards affixed on the platform.
- Do not pull or push from the platform.
- Do not protrude from the railing.

After use

- Ensure that both the structure and platform are in the correct rest position and that the outrigger cylinders are fully retracted.

5.1. CONTROL DEVICES AND MANAGEMENT UNIT

Before using the machine, read all the general safety warnings indicated in chapter 2.

- Do not use the platform (EWP) if you do not have full mastery of the controls and required authorizations.
- The EWP must be positioned on a flat, solid and horizontal surface.
- Using the machine by unauthorized and/or trained personnel is prohibited.

fig. 5.1.1

remote control main panel

Selector switches

The function selectors are found at the bottom of the remote control.

A B C D E F G H

fig. 5.1.2

Controls

The activation levers of the selectable controls are found at the center of the remote control.
Underneath the levers (see arrow) there is the luminous LED indicating that the corresponding control is active.
Always activate the controls gradually and smoothly.

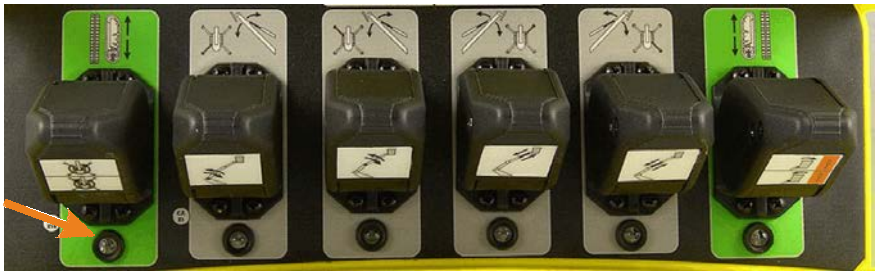


fig. 5.1.3

Load Led 100% - 90%

Luminous indicators showing an excessive load on the platform. The LED activation on the right (**90%**) indicates that the load situation is critical and beyond which the machine will block.

When even the left Leds will activate (**100%**), the machine will block.

To restart the operation, decrease the load.

Where not possible, by waiting about 10 seconds, the machine will allow carrying out only movements that take the load back to the machine center of gravity.

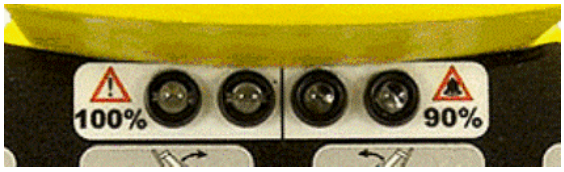


fig. 5.1.4

Display

The multi-functional display shows messages for the operator and data from the T-Can card.

fig. 5.1.5

The buttons at the side of the display allow adjusting luminosity.

- see attachment, messages on display -

SELECTOR SWITCHES

A

The far left selector switch indicated in fig.5.1.2 allows selecting on which part of the machine the function controls should be carried out:

1 - aerial part
2 - outriggers
3 - undercarriage

B
The 2-position selector switch, hare/snail allows selecting the platform movement speed by using the tracked undercarriage (see fig.5.1.2).

C
The RPM +/- linear potentiometer allows adjusting the combustion motor revolutions (see fig.5.1.2).

D
Emergency STOP button**.**
Emergency stop control (see fig.5.1.2).
In the event of danger or malfunction, by pressing the red STOP button, all the moving parts will immediately stop

E
By positioning selector **A** on "2" – outriggers – and using selector switch **E** (see fig. 5.1.2), the automatic descend/ascend of all the outriggers is obtained. Once the required lifting position has been reached, release selector switch E, but keep the orange consent button pressed to allow the automatic leveling of the work platform (symbols on the left side).
By positioning selector switch **A** on '**1**' - EWP -, and using selector switch **E**, the cage starts rotating on the vertical axis, to the left and right (symbols on the right side).
The selector switch has 3 unstable positions and it is enabled by simultaneously pressing OK on the right side of the remote control.

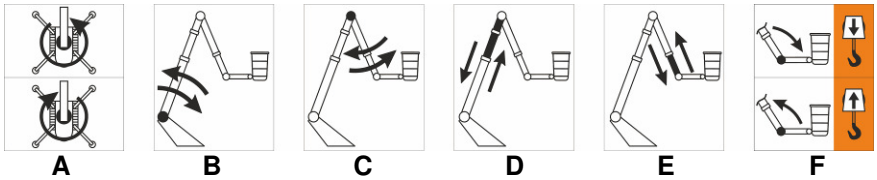
F
Selector switch **F** on the right, fig. 5.1.2, allows the forward/backward rotation of the platform cage, in EWP configuration (symbols on the left side);
In the CRANE configuration, it enables the operation of a hydraulic inlet, for the operation of tools, such as winch, clamp, etc (symbols on the right side).
The EWP-Crane configuration is selected on the **MSS** Master unit, fig. 4.11.2.
The selector switch has 3 unstable positions and it is enabled by simultaneously pressing OK on the right side of the remote control.

G
The selector switch allows activating/deactivating the operation of the combustion motor (see fig.5.1.2).
The selector switch has 3 unstable positions and allows starting and stopping the motor.

H
Luminous indicator to monitor the battery state of the remote control (see fig.5.1.2).
The flashing led (see arrow) indicates that the battery must be recharged or replaced (it is mandatory to always have a spare battery available, in case of emergency in height).

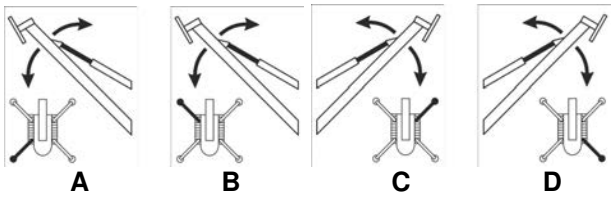
CONTROLS

Aerial part (see fig. 5.1.3)



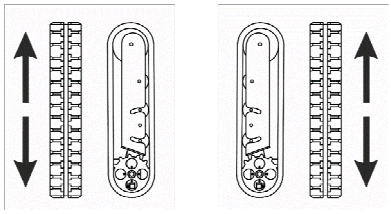
A – rotation of the platform turret
B – rotation of the ascend/descend main arm
C – rotation of the ascend/descend second arm (Jib)
D – movement of the first retraction arm, enter/exit
E – movement of the second retraction arm, enter/exit
F – movement of the cage arm (Plus) forward/backward
In winch configuration, ascend/descend hook.

Stabilizers (see. fig. 5.1.3)



A – ascend/descend left rear stabilizing movement
B – ascend/descend left front stabilizing movement
C – ascend/descend right front stabilizing movement
D – ascend/descend right rear stabilizing movement

Undercarriage (see fig. 5.1.3)



A – forward/reverse left track movement
B – forward/reverse right track movement

Buttons on the side of the remote control

Buttons on the right side:

1 control consent OK button.

1 remote control Start green button.

It connects the transmitter to the receiver; press it for 3 seconds at the beginning and the start the machine.

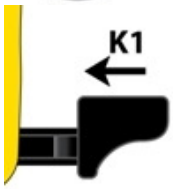
Buttons on the left side:

2 AUX buttons.

Available positions for additional controls.

Buzzer.
Alarm sound indicator.

Connector to pass in wire control version in the platform cage.
Disables the radio signal.



Magnetic key.
Inserted on the right side of the remote control, activates the operation.
The key can also be customized by requiring the codification, so that the remote control "recognizes" the operator.

MANAGEMENT UNIT

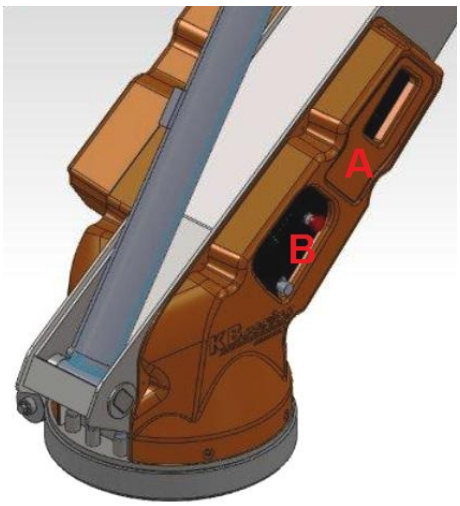


fig. 5.1.6

A – Remote control receiver B – Master unit

	Unità ricevente	
	Led	***Indication***
1	*Data error ch. B* ***(Yellow led)***	*It is normally on during operation. It is off for the time of the data error duration on channel B.*
2	*Passive emergency ch. B* ***(Red led)***	*It is normally off during operation. On indicates that channel B of the system is stopped. In case of error of the system, the errors are indicated by codified flashes.*
3	*Data error ch. A* ***(Yellow led)***	*It is normally on during operation.* It is off for the time of the data error duration on channel A.
4	*Passive emergency ch. A* ***(Red led)***	*It is normally off during operation. On indicates that channel A of the system is stopped. In case of error of the system, the errors are indicated by codified flashes.*
5	*RF busy* ***(Green led)***	*On indicates the presence of a radio signal on the channel.*
6	*Power Supply* ***(Green led)***	*On indicates the presence of power supply.*
7	*Working* ***(Green led)***	*On indicates that the two safety relays have been closed and that controls are now enabled.*

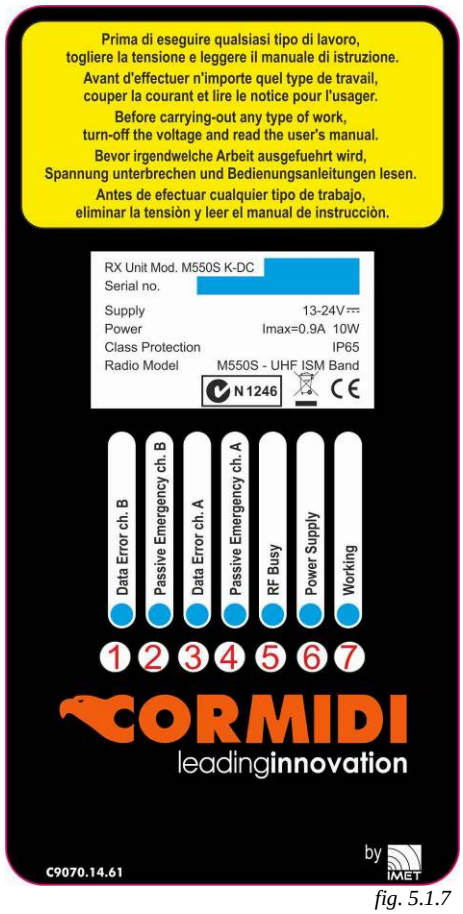

Prima di eseguire qualsiasi tipo di lavoro,
togliere la tensione e leggere il manuale di istruzione.
Avant d'effectuer n'importe quel type de travail,
couper la courant et lire le notice pour l'usager.
Before carrying-out any type of work,
turn-off the voltage and read the user's manual.
Bevor irgendwelche Arbeit ausgefuehrt wird,
Spannung unterbrechen und Bedienungsanleitungen lesen.
Antes de efectuar cualquier tipo de trabajo,
eliminar la tensiòn y leer el manual de instrucciòn.
RX Unit Mod. M550S K-DC
Serial no.
Supply 13-24V
Power Imax=0.9A 10W
Class Protection IP65
Radio Model M550S - UHF ISM Band
N 1246
Data Error ch. B
Passive Emergency ch. B
Data Error ch. A
Passive Emergency ch. A
RF Busy
Power Supply
Working
1 2 3 4 5 6 7
CORMIDI
leadinginnovation
by IMET
C9070.14.61

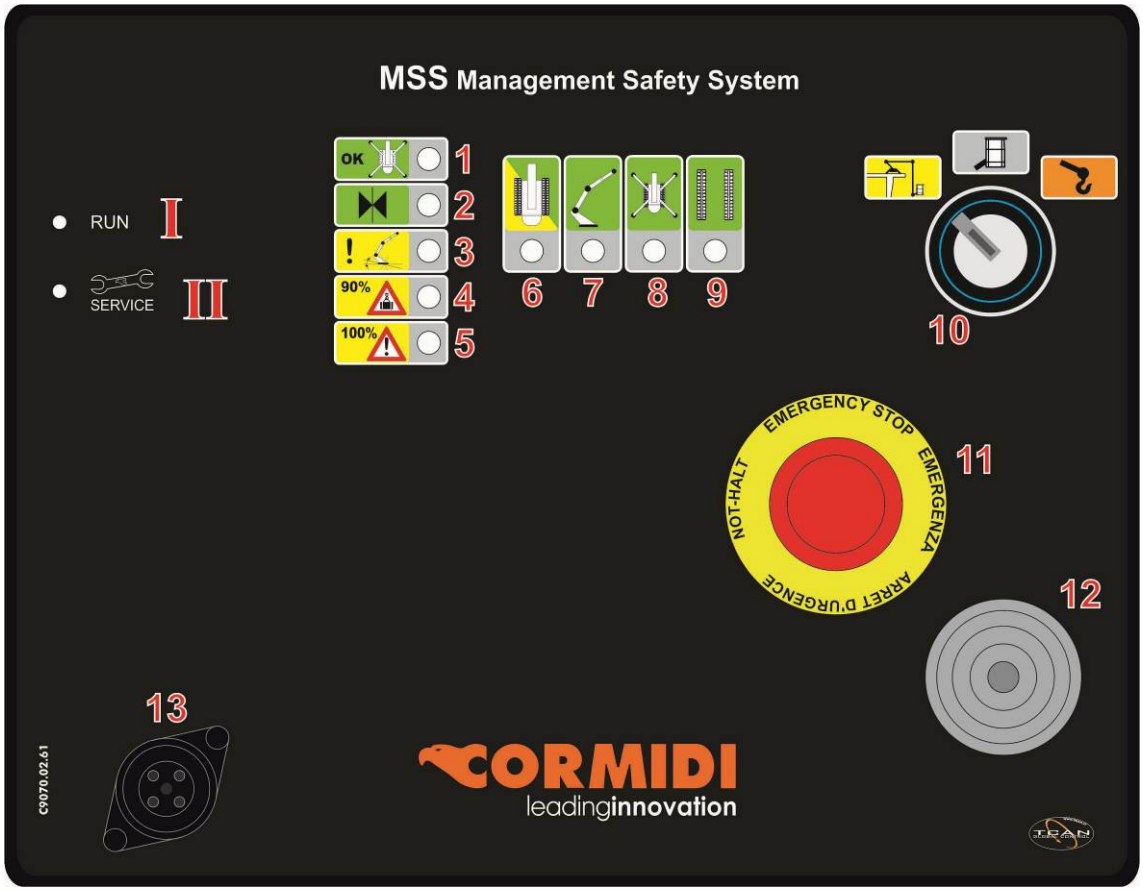
fig. 5.1.7

Auto power off

• The transmitting unit turns off automatically after three minutes of non-use. The function can be disabled upon request and responsibility of the user.

• The transmitting unit turns off when the battery is fully discharged. In that case, before turning off, the led positioned on the transmitter will rapidly blink (6 – power supply).

B – Master Unit - operation electronic panel.



I – RUN the light indicates the proper operation of the control unit.

II – SERVICE the light indicates that is time to have the machine serviced.

1: With the light on, the "A" EWP superstructure movement function (S1) is enabled; it means that the four outriggers rest on the ground.

2: The light on means that the column is at the center, i.e. the end-of-travel indicates that the column has zero rotation on the bearing, compared to the undercarriage, in order to close the EWP for transport.

3: The light on indicates an excessive inclination of the substructure.

4: The light on indicates 90% of the moment limiter block.

5: The light on indicates 100% of the moment limiter block (block of the arm retraction maneuver and arm lower).

6: The light on indicates that the machine is closed, allowing the movement of the outriggers or tracks by means of switch S1.

7: The light on indicates that movement A of the EWP superstructure has been selected using switch S1 from the Remote control panel.

8: The light on indicates that movement B of the substructure outriggers has been selected using switch S1 from the Remote control panel.

9: The light on indicates that movement C of the substructure tracks has been selected using switch S1 from the Remote control panel.

10: Three-position key selector switch. The work mode is selected by rotating the selector switch, removing the key ensures that this does not change.

11: Emergency stop button of the machine. The platform blocks. To release it, rotate the emergency button as indicated by the printed arrow.

12: Buzzer.

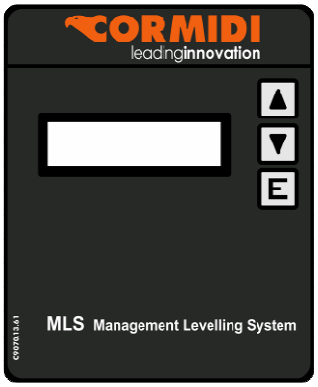
13: 4-pin mil connector for programming the Master Unit.
(for cable connection of the Remote control, disabling the radio signal.)

Leveling sensor

electronic unit for leveling the platform before ascending.

Angular sensor

electronic unit for the platform vertical stability.



Cage leveling

MSS Management Leveling System.
Automatic management unit of the cage leveling.

5.2. EMERGENCY LOWERING CONTROL OPERATION

Manual controls

The manual controls of the valves for enabling the machine emergency operation are placed under the right side bottom guard. They must be activated before using the emergency controls listed below.
Control activation (see fig.5.2.1.a – b):
Loosen the red ring-nut "**A**", tighten the central screw "**B**" until locking it.
Loosen and remove the protection cap "**C**".
Loosen screw "**D**".
In the event of a momentary malfunction of the remote control or the receiver it is possible to restart the combustion engine. Press the button on the side of the unit (fig. 5.2.3) and while keeping it pressed in all subsequent stages wait 10 seconds, then restart the engine with the key (fig. 5.2.4) and operate the control to be activated (see below).
In the event of engine failure or for any other reason, the manual pump and then the control to be activated.
At the end of the emergency, restore the controls in case of a new emergency.

fig 5.2.1.

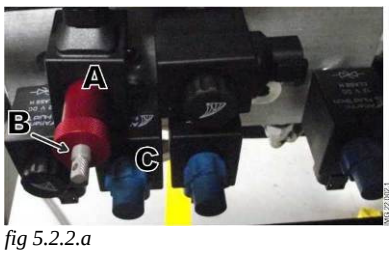


fig 5.2.2.a

fig. 5.2.2.b

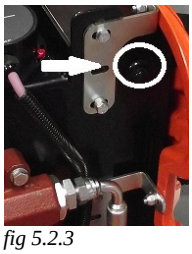


fig 5.2.3

fig. 5.2.4

Note

Refer to the manufacturer or authorized workshop to detect and repair the failure.

Manual Pump

The manual pump is housed in the motor bonnet.
Pump oil in the circuit using lever "**B**" of the manual pump, in order to use the emergency manual controls. (fig. 5.2.5)

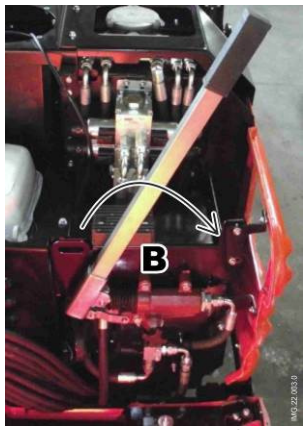


fig 5.2.5

Puller

At the top of the motor bonnet, close to the hydraulic oil tank, there are the valves controlling the undercarriage tracks. Press the right o left pawl of the electro-hydraulic deviator, depending on the required effect.

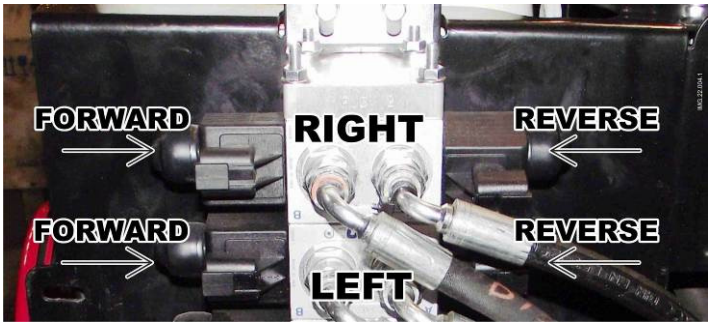


fig. 5.2.6

Opening/closing of the outriggers (stabilizers)

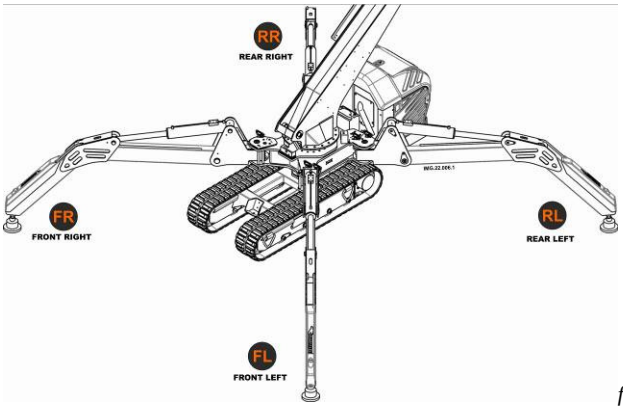


fig. 5.2.7

At the bottom left of the motor bonnet there are the solenoid valves that control the outriggers.
The **RR, FR, FL, RL,** abbreviations identify the 4 outriggers:

RR - rear right
FR - front right
FL - front left
RL - rear left

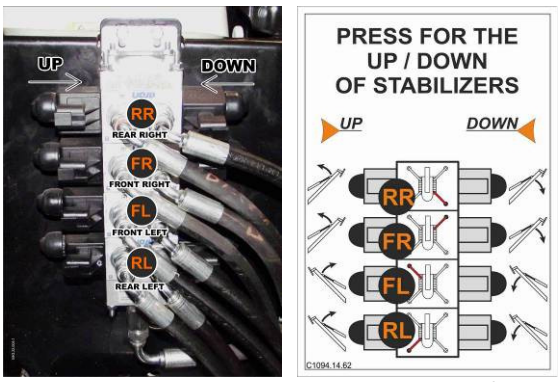


fig 5.2.8

Manual controls of the aerial part

On the right side of the turret, by removing the plastic protection device, there are the solenoid valves that allow controlling the platform aerial part only in case of emergency (see pictogram below).

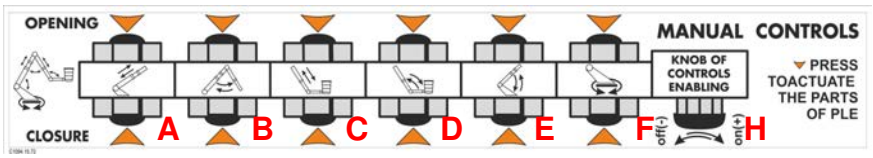


fig 5.2.9b

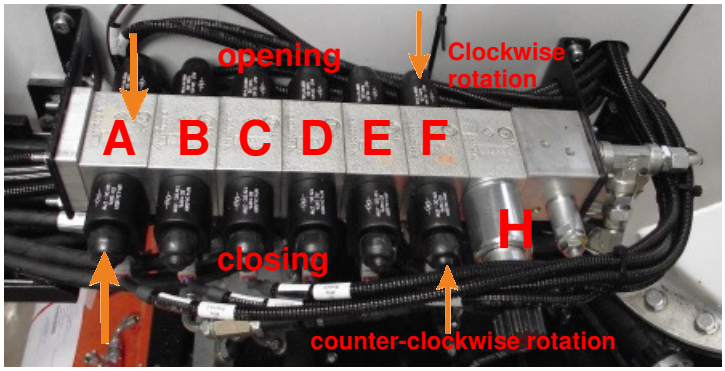


fig. 5.2.9

A – open/close the main retraction arm
B – open/close Jib P&T
C – open/close Jib retraction arm
D – open/close the Plus P&T
E – open/close the main arm
F – clockwise/counter-clockwise turret rotation
H – Valve manual control knob.
Enables the emergency distributor controls, rotating the knob clockwise.

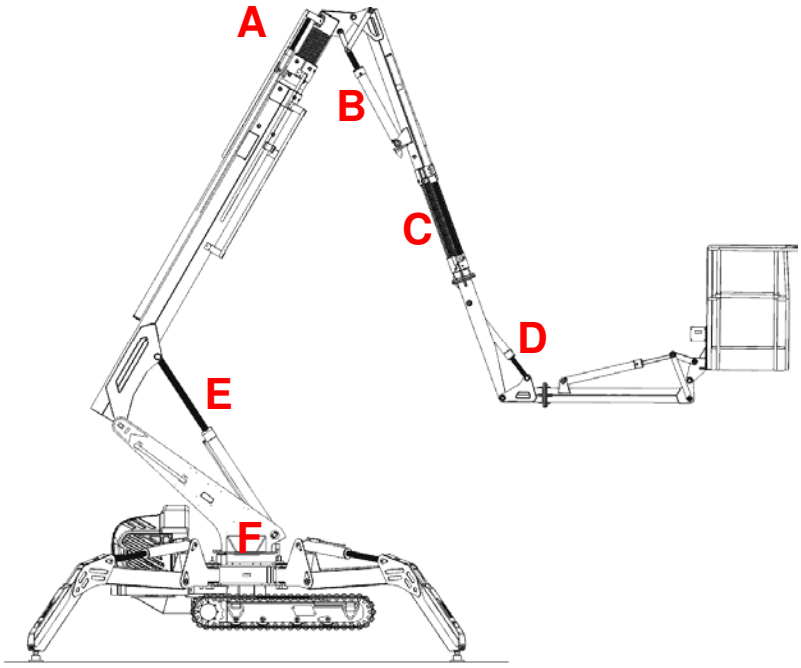


fig. 5.2.10

The operator on the ground must control the rotation until indexes F on column G on the carriage coincide (fig. 5.2.11).
Subsequently, carry out the following operations:
- arm retraction
- arm lower
- pantograph lower.

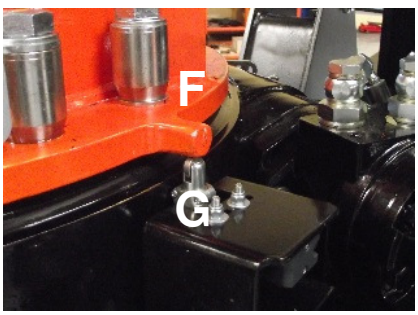


fig. 5.2.11

5.2.1. STARTING WITH AN AUXILIARY BATTERY

ATTENTION:
- Do not make the cable clamps contact each other during the start-up.
- Do not protrude above the batteries.
- To prevent risks of explosion, follow the correct order of the operations as indicated below.

CAUTION:
- Do not use a battery-charger to start in emergency mode.
- Verify that the auxiliary battery has the same electric characteristics of the discharged battery (see data indicated on the battery).

If the battery is discharged, the combustion motor can be started using an auxiliary battery (whether it is isolated or mounted on another device).

Remove the protection device to access the battery, which is located at turret bearing rear, close to the hydraulic oil motor-tank unit.

fig. 5.2.1.1

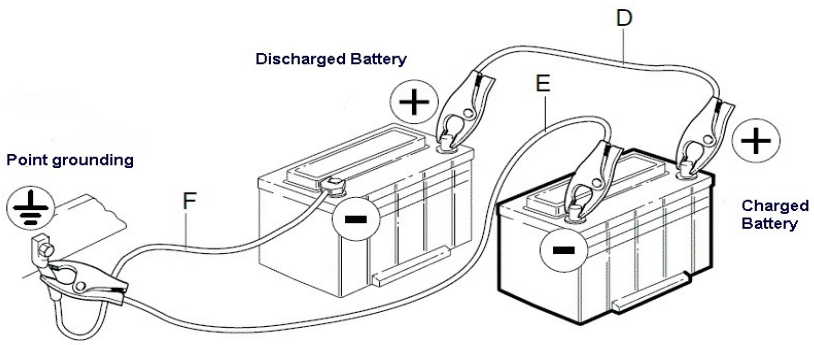


fig.5.2.1.2

In the event a battery or other device is used, turn off its motor before connecting the batteries.

- Connect cable “D” to the positive poles + of the two batteries.
- Connect cable “E” to the negative pole − of the auxiliary battery and to the grounding point of ground cable “F”.
- If the auxiliary battery is mounted on a device, start its motor with slightly accelerated rev speed.
- Wait about one minute and then start the platform (EWP) motor.
- When the motor is started, disconnect the cables starting removing the clamp from the grounding point away from the battery.

For safety reasons, never use the platform with discharged battery.
Replace or recharge the battery, before proceeding using the platform.

Note ____
Should auxiliary batteries be unavailable, start the motor manually. Remove the guard on the motor bonnet left side, and by following the procedure indicated in the motor manual, pull the manual starter.
Also refer to the manual attached to the combustion motor.

5.3. INSPECTIONS TO CARRY OUT BEFORE USING THE MACHINE

CAUTION:
- **Ensure that all the safety devices are installed and efficient.**
- **Ensure that all the protection devices are installed and efficient.**
- **Verify the level of the combustion motor fuel.**
- **Verify the level of the hydraulic oil in the tank.**
- **Ensure that the work platform is properly installed and locked with relative safety bar.**
- **Ensure that there are no leakages in the hydraulic system.**
- **Ensure that there are no obstacles in height or anything that can collide with the mobile parts of the platform (EWP) when handling.**
- **Verify the proper distance from the live electric lines.**
- **Ensure that the key selector switch of the working platform is properly positioned on the function to be used.**
- **Ensure that the ground plate has been connected to the machine base, in the event the machine is connected to the power supply.**
- **Ensure that the platform (EWP) is properly stabilized (see Para 5.7).**
- **Ensure that the ground where the machine is stabilized is solid.**
- **Verify that all safety devices are operational**

5.4. USE MODES

ATTENTION:
Always examine the displacement path, in order to detect any risky zones.
Avoid piles of brushwood, bushes, logs, rocks.
Never pass on them or any other irregularity of the surface that can interrupt adherence or traction regularity on the ground, especially in presence of slopes and differences in level.
Never exceed the allowed maximum slope of the ground (see Para 2.3).
Never go downhill, through undergrounds or patios, walkways, slippery or icy roads, without having performed the due inspections on the inclination and seal of the tracks on the surface to go through

CAUTION:
Do not perform maneuvers on hard and stony surfaces, such as river rock and gravel, or abrasive surfaces, such as sand, stones, minerals, etc.
Avoid steering on asphalt and concrete to prevent premature wear on the tracks.
Avoid maneuvers on paved roads when their temperature exceeds 140 °F (60 °C), to not cause premature wear of the tracks and damage to the road surface.
Do not operate with a loose track as not to make the rubber track exit.
Do not touch the track and cutting and/or sharpen objects. Avoid making the track contact with fuels or synthetic oils; if this occurs, clean immediately.
Avoid using the machine in coastal areas, as salt air or salt in general corrodes the adherence between the rubber parts and the inner metal core.

The machine must be transported with the platform closed and the operator at the side of the work platform.

In case of particularly narrow passages, the work platform can be quickly dismounted from the support. For dismantling the cage, see Para 5.12.

5.4.1. USE OF THE PLATFORM WITH POWER SUPPLY

DANGER:
Ensure that the power supply line corresponds with the voltage and frequency indicated in the technical data.
Ensure that the power cable is in excellent conditions; avoid bending or stretching it, as it can stop the conductors.
In the event a cable extension is used, ensure that is suitable and with a greater section compared to the power cable, in order to prevent dangerous overheating.
A ground plate MUST be rammed into the ground and connected to the specific terminal B on the platform base, or to an efficient ground network, in the event operations are carried out indoors.

The cable must be maximum 50 ft (15 m) long.
Connect the electric line to inlet"**A**".
The electric connection to the machine electro-pump disables the internal combustion engine automatically.

fig. 5.4.1.1

- Electric connection for using tools on board the work platform

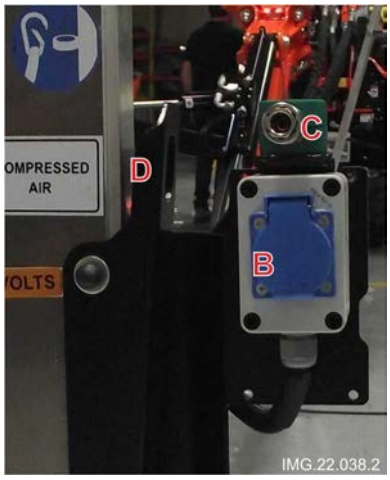


fig. 5.4.1.2

A) Power supply inlet of the work platform.
B) Tool socket in the work platform (drill, screwdriver, etc.) Tool maximum consumption: 3 Kw.

Other:
C) Coupling for compressed air tools.
D) User safety belt fastening ring.

5.4.2. USE OF THE PLATFORM (EWP) WITH COMBUSTION MOTOR.

DANGER:
Never use the combustion motor indoors, unless there is an efficient intake and discharge of lethal gas combustion system.

DANGER:
When work conditions are such to expose the operator to a high and continuous noise (beyond 90 dBA) use ear protective plugs, according to the accident-prevention standards in force.

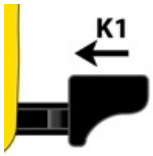
NOTE: The platform internal combustion engine is controlled by a control unit. If no control is used for more than one minute, it turns off to turn on again automatically as soon as any control of the platform is enabled.

5.5. START-UP

5.5.1. STARTING THE COMBUSTION MOTOR

Open the motor bonnet using the key if blocked.
To start the combustion motor, follow the procedure indicated below.

The key of the motor electrical panel must be in position "**ON**" as indicated on the side.



The magnetic key "**K1**" must be inserted in the remote control.

Now, press the green button "**C**" placed on the right of the remote control for three seconds to enable it.
Set the selector **A** of the motor revolutions to the minimum, press switch **B** upwards and start the motor (fig. 5.5.1.1).

fig. 5.5.1.1

Note

Adjust the number of motor revs on a medium speed.
Use maximum speed only for translation

5.5.2. STARTING THE ELECTRO-PUMP MOTOR

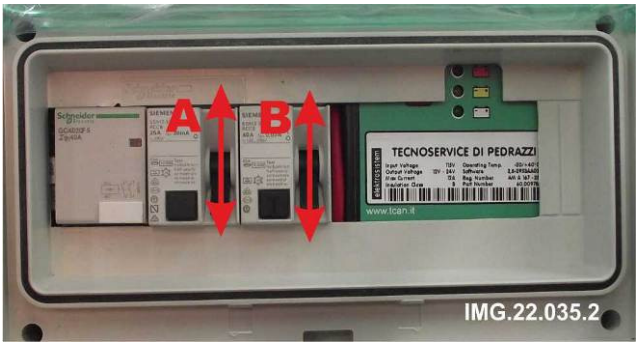


fig. 5.5.2.1

Once the machine has been connected to the mains, as previously seen in fig. 5.4.1.1., the machine can be used in electric mode, controlled by an electro-pump.
To enable the electro-pump, activate differential switch **A**, taking the lever upwards.
By activating it from the machine, the platform will move electrically from now on.
To enable the socket placed in the platform cage, activate differential switch **B**, taking the lever upwards.

NOTE: When the platform is connected to the mains, the main battery of the machine is automatically recharged.

5.6. TRANSLATION OF THE PLATFORM (EWP)

The platform translation occurs by means of the tracked undercarriage and it is enabled by the selector switch placed at the left bottom of the remote control.

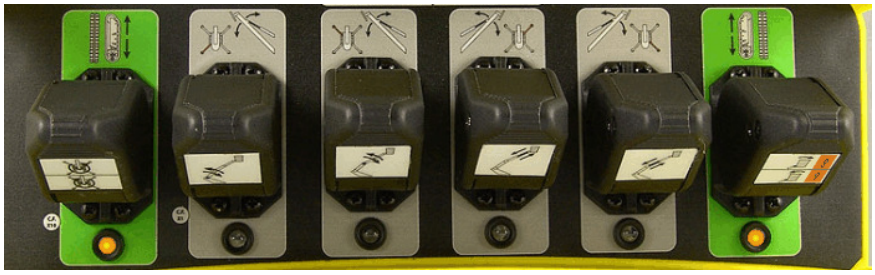


fig. 5.6.1

1) Rotate the function selector to the bottom (undercarriage);

2) The lights on indicate that the undercarriage controls are active (see fig. 5.6.1);

3) Push the levers forward or backward to obtain the required displacement.

Beside this selector switch there is that of the translation speed that allows choosing between slow drive (snail) or fast drive (hare).

Automatic straight drive

By selecting slow speed (snail), the automatic straight drive can be inserted, which allows the straight movement and is very useful when the machine moves on the ramps (e.g. to load it on the mean of transport).

The insertion procedure is very simple:

- select slow speed (snail);
- press the orange OK button, placed on the right of the remote control, for 3 seconds;
- press both the track activation levers, forward and backward;

- The machine advances straight; moreover, if one of the 2 levers is released, the machine stops without rotating.
- To remove the straight drive function, press the orange OK button, on the right of the remote control or rotate the speed selector switch to “hare”.

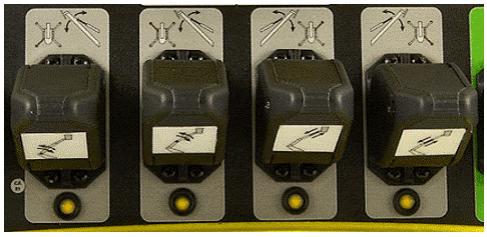
5.7. STABILIZING THE PLATFORM (EWP)

DANGER:

- **If the platform (EWP) is used on public roads, its presence must be highlighted and the workspace must be indicated by means if specific signals.**
- **Pay special attention to the ground consistence where the outriggers rest and in case place a repairing plate to achieve a better distribution of the load to the ground.**
- **Verify that the outriggers do not rest on manholes, sewers, basements and everything that can collapse if under load.**

The lowering and raising of the stabilizers can be done manually or automatically.

- In **manual** mode, activate the descend controls of the outriggers: by rotating the selector switch on the remote control left to the center (stabilization), the manual controls of the outriggers will be activated (leds on)



To level, after having placed the outriggers to the ground, move the outriggers (open/close) with small steps, watching the level on the undercarriage and retracting the instrument level to the center (see fig. 5.7.1).

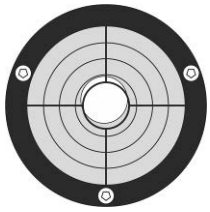


fig. 5.7.1

- In **automatic** mode, the outriggers ascend or descend can be selected by pressing the instable selector switch upwards and simultaneously the green consent button, placed on the right side of the remote control.

The outriggers descend to the ground and when all four touch the soil, the platform starts lifting.
All this happens with the automatic control of the platform planarity (leveling).
The flashing led "**L**" on the outriggers (see fig. above) indicates the correct position of the platform.

5.8. OPENING THE WORK PLATFORM

Once the machine has been stabilized, proceed as follows to open the arm and allow the operator to access the cage:

5.8.1. MANUAL OPENING OF THE PLATFORM:

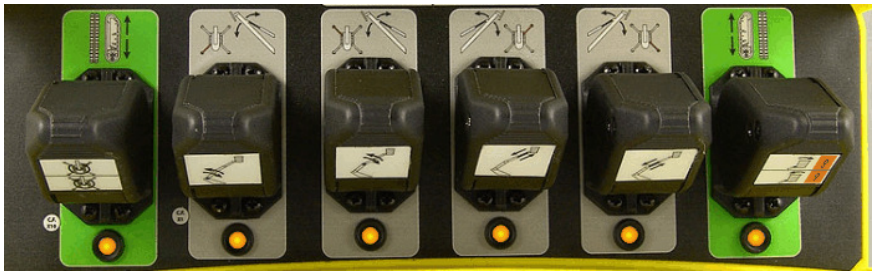


fig. 5.8.1

Rotate the function selector switch upwards (aerial part);

The lights on indicate that the controls are active (see figure 5.8.1 and bis).

1) Lift the main arm "**B**" until reaching a 55° angle with the horizontal part (movement **1**, fig.5.8.2);

2) activate the retraction arm "**D**" making it protruding for about 0.6ft (20cm) (movement **2**, fig.5.8.2), releasing the mechanical safety closure (see fig. 5.10.3);

3) activate the Jib, secondary arm "**C**" bringing it vertically (movement **3**, fig.5.8.2);

4) open the Plus "**F**", lowering the cage (movement **4**, fig.5.8.2).

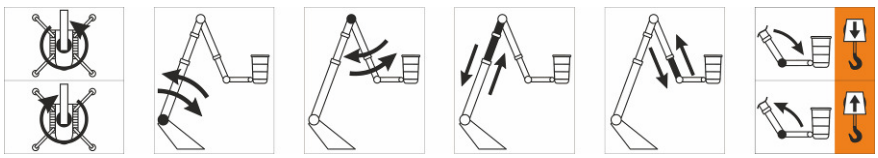


fig. 5.8.1 bis

The cage remains perfectly leveled even without being handled by the operator, as the MSS system manages the cage leveling automatically.

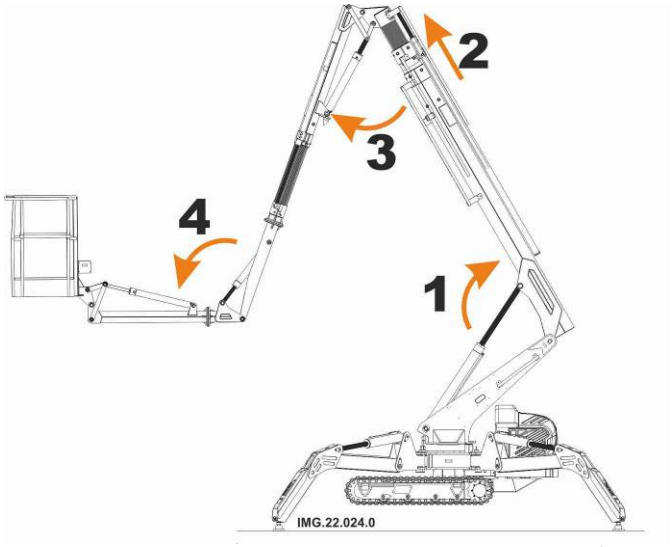


fig. 5.8.2

By activating the active controls, the cage is taken to a few tens of centimeters from the ground, to allow the operator to get on board.

5.8.2. AUTOMATIC OPENING OF THE PLATFORM

If no obstacles are found close to the machine, the KB series platform can be open fully automatically, while the operator follows the opening procedure described below, at a safe distance:

- Rotate the function selector switch upwards (aerial part);

- Press the orange OK button for 3 seconds.

The machine starts moving, following the steps described in the manual procedure (fig. 5.8.2), but fully automatically.

Once it has been opened, the cage will be positioned in front of the machine at a few meters from the ground, in order to allow a comfortable access to the work platform for the operator.

5.9. ASCENDING WITH THE WORK PLATFORM

ATTENTION:
Before ascending with the work platform, the board on the master unit panel MUST be blocked by removing the function enabling key.

Turn the machine motor off using the remote control.
Enter the cage and connect the platform connector to the socket on the bottom of the remote control.

ATTENTION:
If the remote control is not connected, the platform can carry out only a limited number of movements.

Once the remote control has been connected to the connector, it can be positioned in its fixed casing, increasing safety when working.

Fasten the safety belt and connect it to the cage hook indicated.

Restart the remote control to turn on the motor and make the required displacements for ascending with the work platform.

Before using the retraction arm of the main one, we recommend opening the Plus "**F**" using the specific control.

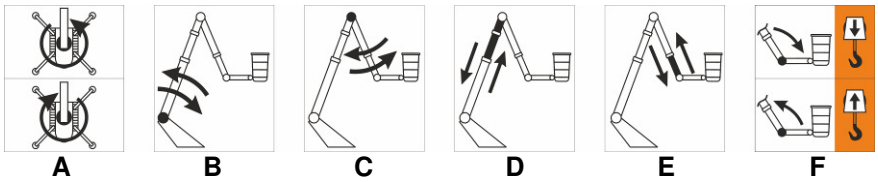


fig. 5.9.1

Note: **Before using the telescoping of the boom, it is recommended to open the Plus "F", with the appropriate command seen before.**

5.10. CLOSING AND STOPPING THE EWP

Follow the inverse manual procedure described for the opening, to close the platform (EWP) (see Para 5.8.1):

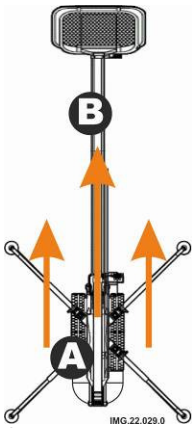


fig. 5.10.1

0) Rotate turret **A** until aligning arm **B** with the undercarriage (see fig. 5.10.1).
1) Take the main arm "**B**" to a 55° angle with the horizontal part (movement **1**, fig.5.8.2);
2) fully close the Plus "**F**", (movement **4**, fig.5.8.2).
3) activate the secondary arm "**C**" bringing it vertically (movement **3**, fig.5.8.2);
4) activate the retraction arm "**D**" retracting it at about 0.6 ft (20 cm) from the complete closure (movement **2**, fig.5.8.2); now, pay attention to the lock of the mechanical safety closure (tip/cylinder) when the telescopic arm fully closes, see fig. 5.10.3).
5) activate the secondary arm "**C**" and fully close it (movement **3**, fig.5.8.2);
6) activate the retraction of the relative arm "**D**". The centering tip (see fig. 5.10.3) must insert inside the cylinder on the main arm, when the telescopic retraction arm fully closes.

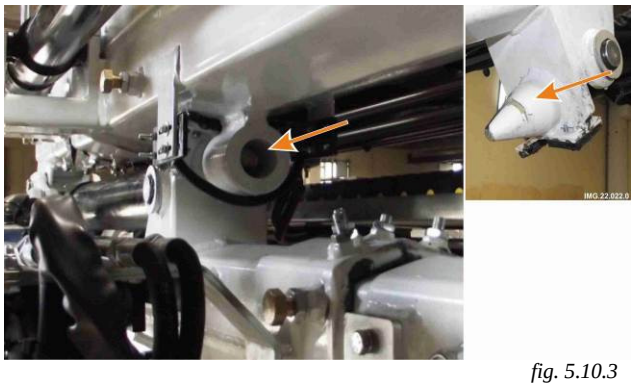


fig. 5.10.3

7) Fully close the main arm "**B**" (movement **1**, fig.5.8.2), until the cage joint closes in the compartment obtained in the front part of the undercarriage (see fig. 5.10.4).

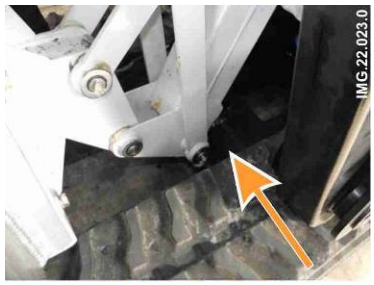


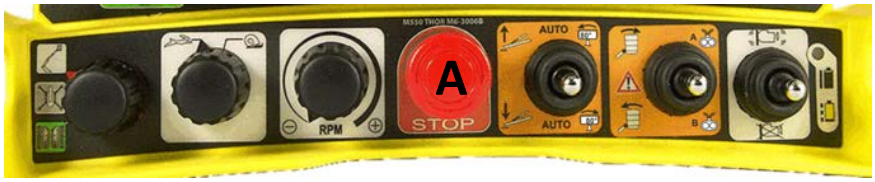
fig. 5.10.4

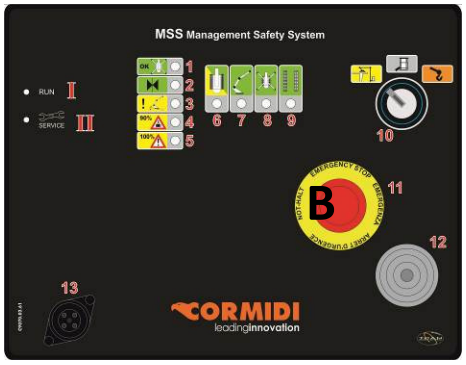
The platform is closed

Once the platform has been closed, it can be moved or transported.

At the end of the operations, turn off the machine by pressing selector switch B downwards (see Para 5.5.1) and always remove the K1 magnetic key from the remote control. Should the machine not be restarted immediately, open the motor bonnet and remove also the key of the internal combustion engine on the left.

5.11. EMERGENCY STOP





Positions that can trigger the emergency stop:
- On board the work platform: in case of emergency, press button "**A**" to immediately stop the machine.
- On the ground: in case of emergency, press button "**B**", at the side of the column, to immediately stop the machine.

To restore the machine:
1) remove the cause that triggered the emergency stop;
2) rotate the emergency clock-wise to remove the emergency block;
3) restart the motor and the machine.

5.11.1. STOP CAUSED BY THE LOAD LIMITER

If the maximum load allowed on the platform is exceeded, the limiting device stops the machine and all its movements.

The anomaly is signaled by a continuous acoustic alarm.

To restore the machine operation, wait about 10 seconds; the system enables only movements that decrease the outreach and, as a result, the work platform load. The continuous acoustic signal stops.

The lights that remain fixed on the remote control indicate the controls that can be normally used, while the flashing lights indicate the controls that can be used only in one direction.

5.12. REMOVING THE WORK PLATFORM

In the event the work platform cage must pass through a too narrow passage, during the load and unload operations from the mean of transport, for maintenance or simply for replacing the cage, thanks to the *quick release* it can be easily removed without using wrenches or other tools.

The quick release is a special mechanism to connect-disconnect the cage with a pin quickly and safely.

The cage is made of aluminium and, therefore, is light; however, to carry out the operation, two persons are required.

The procedure is described below (see fig. 5.12.1-2):
1) take the work platform cage at the ground level;
2) remove the safety pin (1);
3) remove the pin from the other side (2);
4) lift the cage disconnecting it from the support (3)
5) place the cage on a wooden base or supports and move the cage or the work platform.

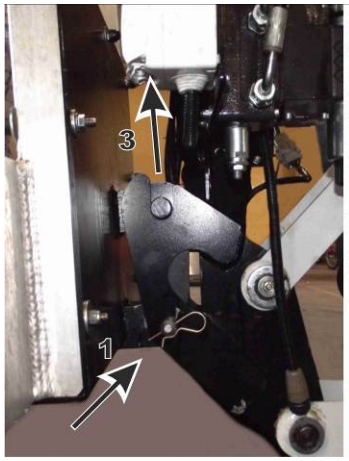


fig. 5.12.1

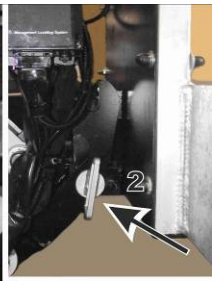


fig 5.12.2

5.13. UNDER BRIDGE CONFIGURATION – CAGE ROTATION

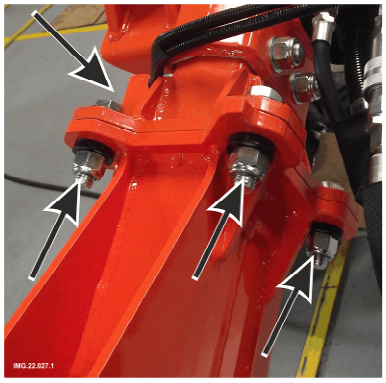


fig. 5.13.1

Should working at a negative height be required, under the supporting surface of the platform, as it could be for maintenance on the lower structure of a bridge, the KB series work platform can be configured in the under bridge mode.

This way, the required point can be reached for maintenance or repair operations, with the platform base resting on the pavement of the bridge.

To configure the platform in the under bridge mode, follow the procedure below, referred to the sequence shown in fig. 5.13.2 in the following page.

- Position the Jib arm vertically and the cage arm horizontally (as in figure A, .5.13.2), at a small distance from the ground (about 0.3ft / 10 cm);
- open the main retraction arm 1, as shown in figure **B** and move the Jib arm vertically, until reaching at least 10 feet (3 meters) from the turret, in order to allow the subsequent rotation of the cage arm;
- loosen the flange pins 2 of fig. **B** (see fig. 5.13.1) and remove the pins;
- The cage arm (see fig. **C**) lowers by a few inches, but remains connected to the Jib, allowing the clockwise rotation 3 of the cage, which is taken towards the platform turret;
- place the pins back and tighten them (see fig. **D**);
- select the “under bridge” function on the MSS Master unit (see fig. 5.13.3);
- restart the platform and proceed working.

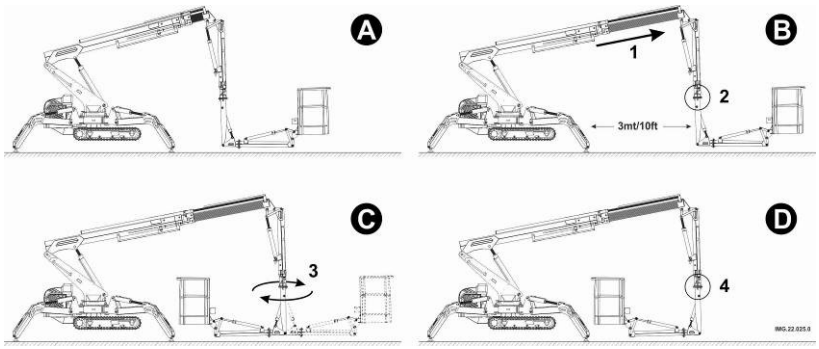


fig. 5.13.2

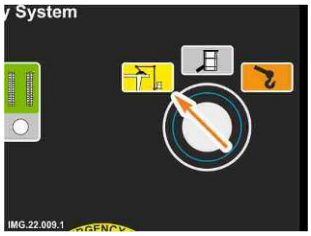


fig. 5.13.3

5.14. REMOVAL PLATFORM ARM

The PLE can become a multifunctional machine by replacing the arm platform with a specific carrier that will make the PLE suitable to be used as a crane, winch, etc..

DANGER:

Use only equipment designed and manufactured by Cormidi exclusively with KB machines. The use of unsuitable equipment, will void the warranty, and can expose the user and the people who are close by to great danger with the possibility of serious injury or death.

To install the arm with the equipment you must first remove the arm platform by carefully following the steps below.

Move the secondary boom vertical "**F**", with the arm of the basket "**L**" level and lower the rack up a few inches from the ground.

When the basket is in the vicinity of the ground extract the support "**S**" from the drum (after removing the pins "**D**"), as show in Fig. 5.14.2, to prevent the basket from tipping and disconnect the arm from the machine and secure it again.

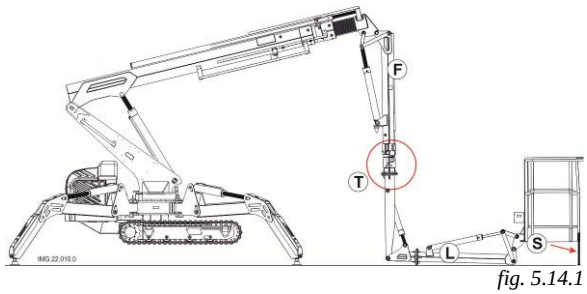


fig. 5.14.1

DANGER:
Always switch off your engine before working on the hydraulic connections of hoses and electrical of the machine, to avoid hazards due to leakage in hydraulic oil pressure or electric shock.

fig 5.14.2

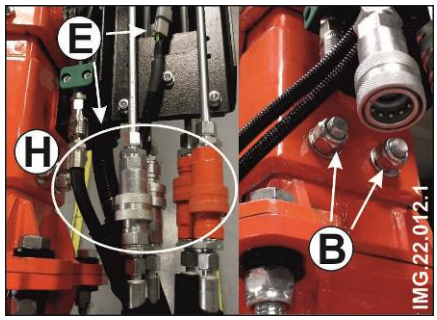


fig. 5.14.3

Once resting the basket on the ground, disconnect the cables and the connect the tubes of the basket, in the junction "**T**".

Always turn off the machine to perform operations release or lock the connectors of electric cables or hydraulic hoses.

Always disconnect the electrical connections "**E**" and then the hydraulic "**H**" (see fig.5.14.3).

Quick connections "**H**" of the hydraulic lines of the drum must be connected and disconnected using the same colors.

Unscrew and remove the two bolts of the arm (see fig. 5.14.3).

Start the machine and raise the arm "**F**" vertically enough to completely disconnect the arm of the basket, always pay attention to the stability of the unit (see Fig. 5.14.4).

fig. 5.14.4

Turn off the machine again.

5.15. CRANE VERSION (OPTIONAL)

If the selected accessories of your machine include the crane, you will be given the crane boom, to use the PLE as a crane for lifting loads.

5.15.1. DIAGRAM WORKING AREA (CRANE)

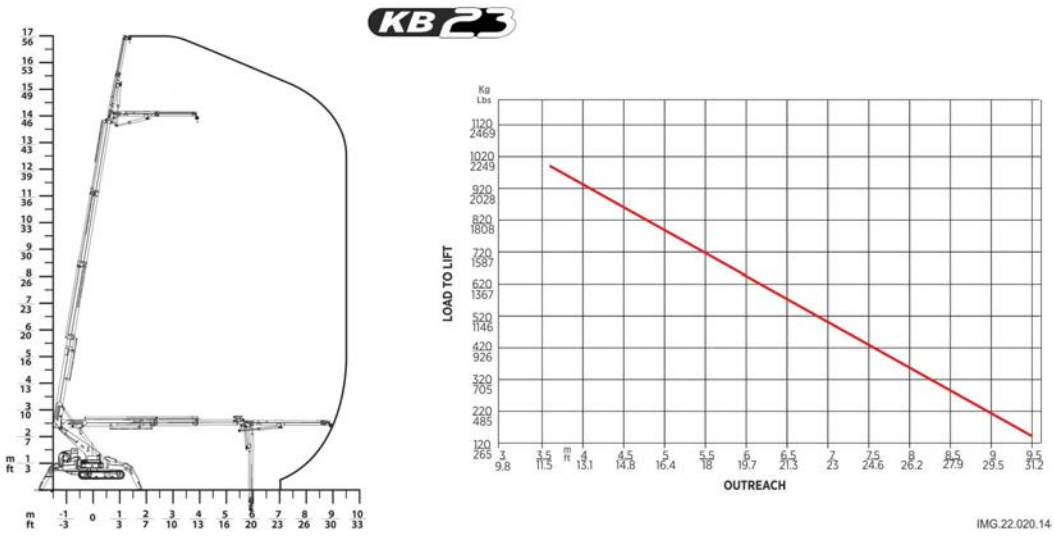


fig. 5.15.1

WARNING:
In the above DIAGRAM the working area is relative to the crane boom produced by Cormidi specifically for use with your PLE: the use of other arms alters the equilibrium conditions and exposes the user and the people who are close by to significant risk.

5.15.2. MOUNT CRANE

To assemble the hoist you must first remove the arm and basket according to the procedure laid down in the relevant section (see § 5.14).

fig. 5.15.2

Insert the crane arm, pushing in the direction of the arrow, until the holes are aligned with those of the arm of the machine so you will be able to insert the two pins "**B**" removed during dismantling and retighten the nuts (see fig. 5.15.2 and fig. 5.14.3).

Before restarting the machine for the job, turn the key switch to the function of the master MSS, the symbol of the hook (see fig.5.15.3), which indicates the mode of operation of the crane.

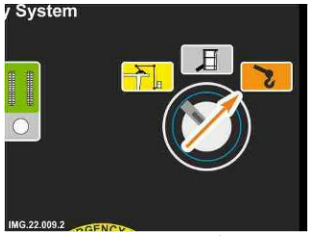


fig. 5.15.3

5.15.3. PRECAUTIONS FOR FOR USING THE CRANE

During the use of the crane you should take every precaution to lifting weights, and in particular you should pay attention to:

- using only approved hooks of suitable capacity (with marking ≥1t);
- always check the capacity and state and wear of any cables and/or chains used to attach loads;
- make sure to set the weights in suitable locations to support the weight;
- when lifting a load make sure the cable works in the vertical;
- avoid swinging the load;
- do not use the crane to drag loads horizontally;
- never use the crane to lift people.

DANGER:
You may not use the crane to lift people: there are many risks of accidents and serious consequences for their safety.

5.16. WINCH STAND (OPTIONAL)

If the selected accessories of your machine include the boom, you will be given the boom winch with winch and cable, to use the PLE as a crane with winch for lifting loads.

For the load capacity of the winch, refer to the technical details in the relevant section (section 4.9).

5.16.1. DIAGRAM WORKING AREA (WINCH)

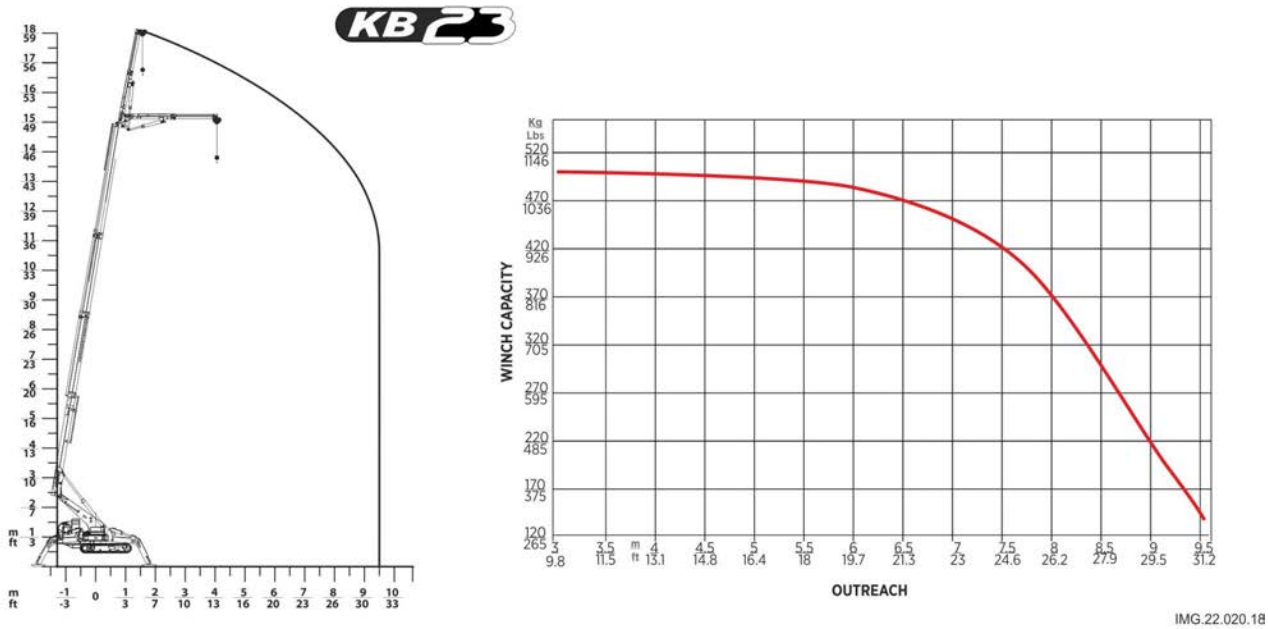


fig. 4.9.4

WARNING:
In the above DIAGRAM the working area is relative to the boom winch produced by Cormidi specifically for use with your PLE: the use of other arms alters the equilibrium conditions and exposes the user and the people who are close by to significant risk.

5.16.2. MAIN PARTS OF WINCH

Ref. fig.5.16.1

S Structure of the winch arm;
B Attachment bolts of the arm;
V Hydraulic winch;
R Support for attachment to rest the cable;
C Cable hoist safety;
P Floating Pulleys;
F Switches cable climb;
T Weight tensioner;
H Safety hook for load suspension;

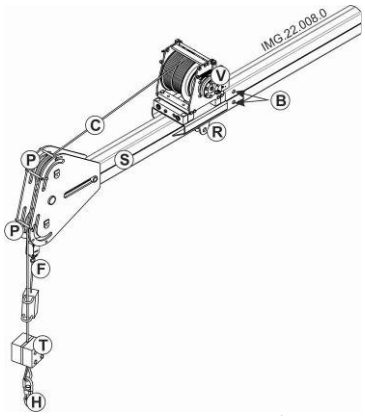


fig. 5.16.1

5.16.3. MOUNT WINCH

The procedure for mounting the winch arm is the same as the instructions provided for the hoist (see § 5.15.2) and therefore need to first remove the arm basket according to the procedure laid down in the relevant section (see § 5.14).

Insert the winch arm, pushing in the direction of the arrow, until the holes are aligned with those of the arm of the machine so you will be able to insert the two pins "**B**" removed during dismantling and retighten the nuts (see Figure 5.16.2 and fig. 5.14.3).

Then you must make the electrical and plumbing connections provided by attaching the connector on the arm and the quick couplings (using the two sockets nearest the arm. See fig. 5.16.2). The lack of connections implies a failed operation of the winch hydraulic maneuver for the winding of the cable.

fig. 5.16.2

5.16.4. PRECAUTIONS FOR USING THE WINCH

When using the crane, even as a winch you must observe the rules and precautions for lifting weights, and in particular should pay attention to:

- using only approved hooks of suitable capacity (with marking ≥1t);
- always check the capacity and state of wear of the cable;
- make sure to set the weights in suitable locations to support the weight;
- when lifting a load make sure the cable works in the vertical;
- avoid swinging the load;
- do not use the crane to drag loads horizontally;
- never use the crane to lift people.

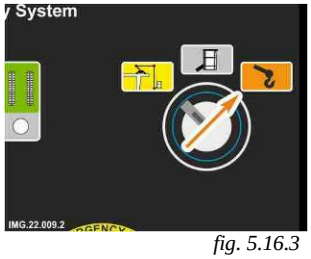


fig. 5.16.3

DANGER:
You may not use the crane to lift people: there are many risks of accidents and serious consequences for their safety.

5.16.5. USING THE WINCH

After installing the arm and making the required connections, you can use the winch to wrap (or play) the cable and lift (or bring down) loads.

To operate the hydraulic motor of the winch pull the trigger "**F**" (see below) in the remote control (see section § 5.1 «Corporate Control and Management Unit»).

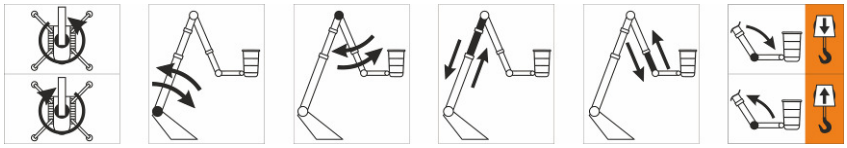


fig. 5.9.1

5.16.6. MAINTENANCE OF WINCH

Every 30 hours

Grease the slide pins of the pulleys and grease the cable.

The hoist cable load must wrap evenly around the drum of the coils forming smoothly: in order to ensure the correct winding and the duration of the cable it is very important to grease and periodically verify that the pulley can float freely along its own axis

fig 5.17.1

5.17. DOWNTIME

During long periods of inactivity, you should completely disconnect the power supply, or at least, disconnect the positive terminal (+) of the battery and properly isolate (fig. 5.17.1).

6. RESPONSIBILITIES OF OWNERS

Owner must conform with
OSHA 1926.1412 - Modified, altered and / or repaired cranes
OSHA 1926.1413 - Wire rope inspections
OSHA 1926.1414 - Wire rope—selection and installation criteria
OSHA 1926.1417 - Operation
OSHA 1926.1418 - Authority to stop operation
OSHA 1926.1422 - Signals—hand signal chart
OSHA 1926.1423 - Fall protection
OSHA 1926.1434 - Equipment modifications
ANSI B30.5:2011 5.2.3 - Crane maintenance
ANSI B30.5:2011 5.2.4 - Rope maintenance

6.1. BASIC PRINCIPLES

Sound principles of safety, training, inspection, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the performance of the responsibilities of owners with due consideration of the knowledge that the aerial platform will be carrying personnel.

6.2. RESPONSIBILITIES UPON PURCHASE.

Upon purchase of the aerial platform, the buyer:
(1) shall ensure the operating and maintenance manuals have been received;
(2) should acquire repair and parts manuals within sixty days (60) of acquisition;
(3) shall within sixty days (60) of acquisition of the aerial platform provide the manufacturer with the full name and address of the buyer along with the model and serial number of the aerial platform acquired;
(4) shall, if the aerial platform is used, ensure the frequent inspection and annual inspections are current;
(5) shall become familiar with and conform to the responsibilities of owners as set forth in the Manual of Responsibilities for Boom-Supported Elevating Work Platforms.

6.3. MANUALS

6.3.1. MACHINE MANUAL(S).

Owners shall provide a copy(ies) of the operating and maintenance manual(s) with each rental, lease, or sales delivery by ensuring they are properly stored in the weatherproof compartment that is part of the aerial platform. The manual(s) is considered an integral part of the aerial platform and is vital to communicate necessary safety information to owners, users and operators. In addition, repair and parts manual(s) should be provided with each sale delivery.

6.3.2. MANUAL OF RESPONSIBILITIES.

The current Manual of Responsibilities for dealers, owners, users, operators, lessors, lessees and brokers of boom-supported elevating work platforms shall be provided and stored in the weather resistant storage compartment.

6.4. MAINTENANCE, INSPECTION AND REPAIR.

6.4.1. MAINTENANCE.

The owner of an aerial platform shall arrange that the maintenance specified in this standard is properly performed on a timely basis. The owner shall establish a preventive maintenance program in accordance with the manufacturer's recommendations and in accordance with the environment and severity of use of the aerial platform.

6.4.2. INSPECTION.

The owner shall arrange for frequent and annual inspections to be performed in accordance with the recommendations of the manufacturer. All malfunctions and problems identified in the inspection shall be corrected before the aerial platform is returned to service.

6.4.3. REPAIRS.

When the aerial platform is damaged or in need of repair, all malfunctions and problems identified shall be corrected before the aerial platform is returned to service.

6.5. PRE-DELIVERY PREPARATION.

Aerial platforms shall be inspected, serviced, and adjusted in accordance with the manufacturer's specifications prior to each delivery by sale, lease, or rental.

6.6. FREQUENT INSPECTION.

The owner of an aerial platform shall ensure that a frequent inspection is performed in accordance with the manufacturer's instructions, on an aerial platform:
(1) That was purchased used. This inspection shall be accomplished unless it is determined that the frequent and annual inspections are current;
(2) That has been in service for three months or 150 hours, whichever comes first;
(3) That has been out of service for a period longer than 3 months
The inspection shall be made by a person qualified as a mechanic on the specific type aerial platform or one having similar design characteristics. The inspection shall be in accordance with items specified by the manufacturer for a frequent inspection and shall include, but not limited to the following:
(1) All functions and their controls for speed(s), smoothness, and limits of motion;
(2) Lower controls including the provisions for overriding of upper controls;
(3) All chain and cable mechanisms for adjustment and worn or damaged parts;
(4) All emergency and safety devices;
(5) Lubrication of all moving parts, inspection of filter element(s), hydraulic oil, engine oil, and coolant as specified by the manufacturer;
(6) Visual inspection of structural components and other critical components such as fasteners, pins, shafts, and locking devices;
(7) Placards, warnings and control markings;
(8) Items specified by the manufacturer;
(9) Emergency lowering means.

6.7. ANNUAL INSPECTION.

The owner of an aerial platform shall ensure that an annual inspection is performed on the aerial platform no later than thirteen (13) months from the date of the prior annual inspection. The inspection shall be made by a person(s) qualified as a mechanic on the specific type of aerial platform or one having similar design characteristics. The inspection shall be in accordance with items specified by the manufacturer for an annual inspection. The owner shall not place the aerial platform into service until all malfunctions and problems have been corrected.

6.8. MAINTENANCE SAFETY PRECAUTIONS.

Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable:
(1) Power plant stopped and starting means rendered inoperative;
(2) All controls in the "Off" position and all operating systems secured from inadvertent motion by brakes, blocks, or other means;
(3) Elevating assembly and platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping;
(4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components;
(5) Safety props or latches installed where applicable as prescribed by the manufacturer;
(6) Precautions specified by the manufacturer.

6.9. REPLACEMENT PARTS.

When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

6.10. MAINTENANCE TRAINING.

The owners shall train their maintenance personnel in inspection and maintenance of the aerial platform in accordance with the manufacturer's recommendations and Sections 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9 and 6.11 of this standard and with the manufacturer's recommendations.

6.11. TRAINING.

6.11.1. OPERATOR TRAINING.

Whenever an owner directs or authorizes an employee to operate an aerial platform (loading, unloading, inspecting or any form of use), the owner shall assume the responsibilities of the user as specified in Section 7 of this standard and shall ensure the person has been:
(1) Trained;
(2) Familiarized with the aerial platform to be operated;
(3) Made aware of the responsibilities of operators as outlined in Section 8 of this standard.

6.11.2. ASSISTANCE TO USER.

Upon request of the user, when an owner sells, leases, rents or provides an aerial platform for any form of beneficial use, the owner at that time shall offer to do training or advise the user where training may reasonably be secured.

6.12. FAMILIARIZATION UPON DELIVERY.

Upon delivery for lease, rental or any form of beneficial use, the owner shall have the responsibility with the person designated by the receiving entity for accepting the aerial platform to:
(1) Identify the weather resistant compartment (for manual(s) storage);
(2) Confirm all manuals, as specified by the manufacturer, are on the aerial platform;
(3) Review control functions with the operator or person(s) designated by the user;
(4) Review safety devices specific to the model aerial platform being delivered.

6.13. OPERATION.

When an owner operates an aerial platform, the owner shall have the responsibilities of users as specified in Section 7 of this standard and his operating personnel shall have responsibilities of operators as specified in Section 8 of this standard.

6.14. ASSISTANCE TO USERS AND OPERATORS.

If an owner is unable to answer a user's or operator's question(s) relating to rated capacity, intended use, maintenance, repair, inspection, or operation of the aerial platform, the owner shall obtain the proper information from the dealer or manufacturer and provide that information to the user or operator.

6.15. RECORD RETENTION AND DISSEMINATION.

6.15.1. RECORD RETENTION.

The owner shall date and retain the following records for at least 4 years:
(1) Name and address of the purchaser of each aerial platform by serial number and date of delivery;
(2) Written records of the frequent and annual inspections performed. The record shall include deficiencies found, corrective action accomplished and identification of the person(s) performing the inspection and repairs;
(3) Written records of repairs accomplished on the aerial platform. The records shall include corrective action accomplished and identification of the person(s) performing the repairs;
(4) Pre-delivery preparation performed prior to each delivery;
(5) Name of the person(s) trained;
(6) Name of person(s) providing training;
(7) Name of person(s) receiving familiarization upon each delivery unless the individual has been provided with familiarization on the same model, or one having characteristics consistent with the one being delivered, within the prior 90 days;
(8) Name of person(s) providing familiarization upon delivery.

6.15.2. PROOF OF TRAINING.

Owners providing training should provide successful trainees a means to evidence their training and shall provide such proof if requested by the trainee.
The document evidencing training shall include the following information:
(1) Name of entity providing training or retraining;
(2) Name of trainer(s);
(3) Clear identification that training covered Boom-Supported Elevating Work Platforms;
(4) Date of training;
(5) Name of trainee.

6.15.3. RECORD DISSEMINATION.

Upon request, an owner accomplishing training and/or familiarization shall provide the following:
(1) To a user, proof of training for an operator, including name of trainer and date of training;
(2) To a user, the name of the person(s) receiving familiarization upon delivery of the aerial platform.

6.16. MODIFICATIONS.

The owner shall not modify or concur in modification or alteration to the aerial platform without the modifications being approved and certified in writing by the manufacturer.

6.17. MANUFACTURER'S SAFETY BULLETINS.

The owner shall comply with safety related bulletins as received from the manufacturer or dealer.

6.18. RESPONSIBILITIES UPON SALE.

Upon sale of the aerial platform, the seller:
(1) Shall, upon delivery, ensure the operating and maintenance manuals are conveyed to the new owner;
(2) Shall, upon delivery, provide a copy of the current Manual of Responsibilities to the new owner;
(3) Should provide repair and parts manuals to the new owner;
(4) Shall, upon the request of the new owner, offer training or advise where training may reasonably be obtained.

7. RESPONSIBILITIES OF USERS

User must conform with
OSHA 1926.1412 - Modified, altered and / or repaired cranes
OSHA 1926.1413 - Wire rope inspections
OSHA 1926.1414 - Wire rope—selection and installation criteria
OSHA 1926.1417 - Operation
OSHA 1926.1418 - Authority to stop operation
OSHA 1926.1422 - Signals—hand signal chart
OSHA 1926.1423 - Fall protection
OSHA 1926.1434 - Equipment modifications
ANSI B30.5:2011 5.2.3 - Crane maintenance
ANSI B30.5:2011 5.2.4 - Rope maintenance

7.1. BASIC PRINCIPLES.

The information in this standard must be supplemented by good job management, safety control, and the application of sound principles of safety, training, inspection, maintenance, application and operation, consistent with all data available regarding the parameters of intended use and expected environment. Since the user has direct control over the application and operation of aerial platforms, conformance with good safety practices in this area is the responsibility of the user and the operating personnel, including the operator. Decisions on the use and operation of the aerial platform must always be made with due consideration for the fact that the aerial platform will be carrying personnel whose safety is dependent on those decisions.

7.2. MANUALS

7.2.1. MACHINE MANUALS.

Users shall keep and maintain a copy(ies) of the operating and maintenance manual(s) in the weather resistant storage compartment provided by the manufacturer. The manual(s) is considered an integral part of the aerial platform and is vital to communicate necessary safety information to users and operators.

7.2.2. MANUAL OF RESPONSIBILITIES.

The current Manual of Responsibilities for dealers, owners, users, operators, lessors, lessees and brokers of boom-supported elevating work platforms shall be provided and stored in the weather resistant storage compartment.

7.3. INSPECTION AND MAINTENANCE.

Users shall inspect and maintain the aerial platform as required to ensure proper operation. The frequency of inspection and maintenance shall be determined by the manufacturer's recommendations and be compatible with operating conditions and the severity of the operating environment. Aerial platforms that are not in proper operating condition shall be immediately removed from service until repaired. Repairs shall be made by a qualified person and the repairs shall be in conformance with the manufacturer's recommendations.

7.3.1. FREQUENT INSPECTION.

Users of an aerial platform shall ensure that frequent inspections are conducted as outlined in Section 6.6 of this standard.

7.3.2. ANNUAL INSPECTION.

Users of an aerial platform shall ensure that annual inspections are conducted as outlined in Section 6.7 of this standard.

7.3.3. PRE-START INSPECTION.

Before use each day or at the beginning of each shift, the aerial platform shall be given a visual inspection and functional test including, but not limited to, the following:

(1) Operating and emergency controls;
(2) Safety devices;
(3) Air, hydraulic and fuel system leaks;
(4) Cables and wiring harness;
(5) Loose or missing parts;
(6) Tires and wheels;
(7) Placards, warnings, control markings, and operating manual(s);
(8) Outriggers, stabilizers, extendable axles and other structures;
(9) Guardrail system;
(10) Items specified by the manufacturer;

7.3.4. MAINTENANCE SAFETY PRECAUTIONS.

Before adjustments and repairs are started on an aerial platform, the following precautions shall be taken as applicable:
(1) Power plant stopped and starting means rendered inoperative;
(2) All controls in the "Off" position and all operating systems secured from inadvertent motion by brakes, blocks, or other means;
(3) Boom and platform lowered to the full down position, if possible, or otherwise secured by blocking or cribbing to prevent dropping;
(4) Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components;
(5) Safety props or latches installed where applicable as prescribed by the manufacturer;
(6) Precautions specified by the manufacturer.

7.4. REPLACEMENT PARTS.

When parts or components are replaced, they shall be identical or equivalent to original aerial platform parts or components.

7.5. MAINTENANCE TRAINING.

The user shall ensure only qualified personnel inspect and maintain the aerial platform in accordance with the manufacturer's recommendations and Section 7.3, 7.4 and 7.6 of this standard and with the manufacturer's recommendations.

7.6. OPERATOR TRAINING AND RETRAINING.

Whenever a user directs or authorizes an individual to operate an aerial platform, the user shall ensure that the person has been:
(1) trained before being assigned to operate the aerial platform;
(2) familiarized with the aerial platform to be operated;
(3) made aware of responsibilities of operators as outlined in Section 8 of this standard;
(4) retrained, if necessary, based on the user's observation and evaluation of the operator.

7.6.1. TRAINEE RECORDS.

A record of the trainee's aerial platform instruction shall be maintained by the user for at least four (4) years.

7.7. FAMILIARIZATION BEFORE USE.

The user shall permit only properly trained personnel to operate an aerial platform. The user shall ensure that before use the operator is familiar with the model of the aerial platform to be operated, and specifically:
(1) Knows where the weather resistant compartment for manual(s) storage is located;
(2) Knows the operating and maintenance manuals supplied by the manufacturer are stored in the weather resistant compartment and is familiar with the operating and safety manuals;
(3) Understands all control functions, placards and warnings.
(4) Is aware of and understands all safety devices specific to the model aerial platform being used.

7.8. WORK PLACE INSPECTION.

Before the aerial platform is used and during use, the user shall check the area in which the aerial platform is to be used for possible hazards such as, but not limited to:

(1) Drop-offs or holes, including those concealed by water, ice, mud, etc;
(2) Slope(s);
(3) Bumps and floor obstructions;
(4) Debris;
(5) Overhead obstructions and electrical conductors;
(6) Hazardous locations and atmospheres (reference ANSI/NFPA 505-1996);
(7) Inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating configurations;
(8) Wind and weather conditions;
(9) Presence of unauthorized persons;
(10) Other possible unsafe conditions.

7.9. DETERMINATION OF HAZARDOUS LOCATIONS.

It shall be the responsibility of the user to determine the hazard classification of the intended location of operation. Aerial platforms operated in hazardous locations shall be approved in accordance with, and of the type required, by ANSI/NFPA 505-1996.

7.10. OPERATOR WARNINGS AND INSTRUCTIONS.

The user shall direct personnel operating the aerial platform to be in compliance with the provisions set forth in this standard. The user shall monitor their performance and supervise their work to ensure the use, application, and operation of the aerial platform is in conformance with the provisions set forth in Section 8 of this standard, warn personnel of potential hazards, provide means to protect against identified hazards, and explain the potential consequences of not following proper operating guidelines. Instructions and guidelines regarding proper operation shall include, but not necessarily be limited to the following issues and subjects:

(1) Fall Protection.
Principal fall protection is provided by the guardrail system. The user shall direct and monitor the operator to ensure that all components of the guardrail system are in place. The user shall direct and monitor occupants of the work platform to ensure that they wear a personal fall arrest system to protect against the potential effects of ejection or a fall restraint system to prevent free fall.
(a) Election of Systems: The user may elect to use either a restraint or an arrest system
1. Fall Restraint Systems – An anchorage, belt or harness and a lanyard which prevent free fall. These systems are arranged to keep occupants in the platform in the event of dynamic forces which might cause ejection.
(1.1) Occupants shall use a restraint system to keep the occupant(s) within the platform.
(1.2) Restraint systems may include either belts or harnesses and do not include arresting or deceleration devices.
2. Fall Arrest System – An anchorage, full body harness and a lanyard used to arrest an employee in a fall from an aerial platform. Such systems allow a fall over the guardrail system.
The force applied to the body shall be limited to 1800 lbs. (8,000N).
(2.1) A fall arrest system shall allow workers to move around the platform but provide a minimum of lanyard slack.
(2.2) A fall arrest system for aerial lifts shall include a lanyard, and full body harness. A deceleration device if used will not allow a fall further than that required to arrest the fall without exceeding 1800 lbs. (8,000N) of force on the worker. Fall arrest systems, beyond the anchorage, are not part of the aerial work platform and are to be specified and supplied by the user of the aerial work platform.

(2) Slope and grade.
The aerial platform shall not be operated in any manner on grades, side slopes or ramps exceeding those for which the aerial platform is rated by the manufacturer.

(3) Deployment of stability enhancing means.
Outriggers, stabilizers, extendable axles, oscillating axles or other stability enhancing means shall be deployed and locked into place as required by the manufacturer.

(4) Guardrail system.
Guardrails shall be installed and positioned, and access gates or openings shall be properly closed per the manufacturer's instructions.

(5) Distribution of load.
The load and its distribution on the platform and any platform extension(s) shall be in accordance with the manufacturer's rated capacity for that specific configuration.
(6) Maintaining overhead clearance.
The operator shall be instructed to ensure that adequate clearance is maintained from overhead obstructions and energized electrical conductors and parts.
(7) Electrocution hazard.
All applicable safety related work practices intended to prevent electric shock covered by the Code of Federal Regulations (CFR) 1910.333 shall be defined and explained to the operator by a qualified person. In particular, such person shall direct the operator commensurate with the operators qualifications to maintain the minimum approach distance (MAD) from energized power lines and covered by CFR1910.333c.
(8) Personal protective equipment (PPE).
The user shall direct the operator to ensure all personnel on the platform wear personal protective equipment (PPE) as required.
(9) Personnel footing.
Personnel shall maintain a firm footing on the platform floor while working thereon. Climbing by occupants on the mid-rail or top-rail of the aerial platform is prohibited. The use of planks, ladders, or any other devices on the platform for achieving additional height or reach is prohibited.
(10) Precaution for other moving equipment.
When other moving equipment and vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace. Warnings such as, but not limited to, flags, roped off areas, flashing lights, and barricades shall be used as appropriate.
(11) Reporting problems or malfunctions.
The user shall direct the operator to immediately report to a supervisor any problem(s) or malfunction(s) that become evident during operation. The user shall ensure all problems and malfunctions that affect the safety of operations are repaired prior to continued use.
(12) Reporting potentially hazardous locations.
The user shall direct the operator to immediately report to a supervisor any potentially hazardous location(s) that become evident during operation.
(13) Hazardous location operation.
Operation of aerial platforms not approved and marked for operation in a hazardous location shall be prohibited.
(14) Entanglement.
Care shall be taken to prevent rope, electric cords, and hoses, etc., from becoming entangled in the aerial platform.
(15) Capacity limitations.
Rated capacities and rated number of occupants shall not be exceeded when loads are transferred to the platform at any height.
(16) Work area.
The user shall direct the operator to ensure the area surrounding the aerial platform is clear of personnel and equipment before lowering the platform.
(17) Fueling.
The engine (if applicable) shall be shut down while fuel tanks are being filled. Fueling shall be done in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.
(18) Battery charging.
Batteries shall be charged in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.
(19) Improper platform stabilization.
The aerial platform shall not be positioned against another object to steady the platform or improve stability.
(20) Misuse as a crane.
The aerial platform shall not be used as a crane.
(21) Unusual operating support conditions.
The aerial platform shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment unless the application is approved in writing by the manufacturer or a qualified person.
(22) Travel speeds.
The user shall direct the operator to limit travel speed according to conditions, including the condition of the support surface, congestion, visibility, slope, location of personnel, and other factors leading to hazards which may cause collision(s) or result in potential injury(ies) to personnel.

(23) Driving requirements.
Before and during driving while the platform is elevated, the user shall direct the operator to:
(a) Maintain a clear view of the support surface and route of travel;
(b) Ensure personnel in the worksite area that may be affected are aware of the movement, communicating and maneuvering the aerial platform as required to protect against personal injury;
(c) Maintain a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps, and other hazards to ensure safe travel;
(d) Maintain a safe distance from overhead obstructions and energized electrical conductors.

(24) Stunt driving.
Stunt driving and horseplay are prohibited.

(25) Securing the aerial platform.
The user shall direct the operator to implement means provided to protect against use by an unauthorized person(s).

(26) Altering safety devices.
Interlocks or other safety devices shall not be altered or disabled.

(27) Snagged platform.
If the platform or elevating assembly becomes caught, snagged, or otherwise prevented from normal motion by adjacent structures or other obstacles such that control reversal does not free the platform, all personnel shall be removed from the platform before attempts are made to free the platform using lower controls.

(28) Vacating (or entering) an elevated aerial platform.
If permitted by the manufacturer, personnel shall only vacate or enter a raised aerial platform by following the guidelines and instructions provided by the manufacturer.

(29) Modifications.
Modification or alteration of an aerial platform or the fabrication and attaching of frameworks, or the mounting of attachments for holding tools or materials onto the platform or the guardrail system shall only be accomplished with the prior written permission of the manufacturer.

(30) Assistance to the operator.
If an operator encounters any suspected malfunction of the aerial platform, or any hazard or potentially unsafe condition relating to capacity, intended use or safe operation of the aerial platform, the operator shall cease operation of the aerial platform and request further information from the user.

(31) Problems or malfunctions.
Any problem(s) or malfunction(s) that affect the safety of operations shall be repaired prior to the use of the aerial platform.

(32) Carrying materials (larger than the platform).
The user shall ensure that only properly secured tools and materials which are evenly distributed and can be safely handled by a person(s) working from the platform, are moved.

(33) Rated horizontal force.
The user shall direct the operator not to exceed the manufacturer's rated horizontal force.

(34) Bridge cranes.
When an aerial platform is to operate within the area of travel of a bridge crane or similar equipment, steps shall be taken to prevent a collision with the aerial platform.

(35) Adequate support requirements.
The user shall ensure the support surface is adequate for the aerial platform and the load carried.

(36) Leveling the aerial platform.
Outriggers and leveling devices supplied by the manufacturer shall be utilized to level the aerial platform when provided.

(37) Protecting against unauthorized use.
The user shall direct the operator not to use, rent, lease, or provide the aerial platform for any form of beneficial use unless so authorized.

7.11. USER AS OPERATOR.

If a user is also the operator of an aerial platform, the user shall have the responsibilities of operators specified in Section 8 of this standard as well as responsibilities of users as specified in Section 7 of this standard.

7.12. SHUTDOWN OF AERIAL PLATFORM.

The user shall authorize and direct the operating personnel to cease operation of the aerial platform in case of any suspected malfunction(s) of the aerial platform, or any hazard or potentially unsafe condition(s)

that may be encountered and to request further information as to safe operation from the owner, dealer, or manufacturer before further operation of the aerial platform.

7.13. RECORD RETENTION AND DISSEMINATION.

7.13.1. RECORD RETENTION.

The user shall retain the following records for at least 4 years:
(1) Names of the operator(s) trained and retrained;
(2) Names of operator(s) provided familiarization;
(3) The owner (or the entity designated by the owner) is responsible to ensure frequent and annual inspections are conducted and written records are maintained. The records shall include the date of the inspection, any deficiencies found, the corrective action recommended and identification of the person(s) performing the inspection.
(4) When employees of the user accomplish repairs on the aerial platform, the user shall maintain written records. The record shall include the date of repair, a description of the work accomplished and identification of the person(s) performing the repair.

7.13.2. RECORD DISSEMINATION

(1) When the user directs personnel to accomplish frequent or annual inspections, not later than 60 days after the inspections, the appropriate records shall be provided to the owner of the aerial platform;
(2) When the user directs personnel to accomplish repairs on the aerial platform, not later than 60 days after the repairs are accomplished, the appropriate records shall be provided to the owner.

7.13.3. PROOF OF TRAINING.

Users providing training should provide successful trainees a means to evidence their training and shall provide such proof if requested by the trainee. The document evidencing training shall include the following information:
(1) Name of entity providing training or retraining;
(2) Name of trainer(s);
(3) Clear identification that training covered Boom-Supported Elevating Work Platforms;
(4) Date of training;
(5) Name of trainee.

7.14. MODIFICATIONS.

Modification, alteration or remanufacture of an aerial platform shall be made only with prior written permission of the manufacturer.

7.15. MANUFACTURER'S SAFETY BULLETINS.

The user shall comply with safety related bulletins as received from the manufacturer, dealer, or owner.

8. RESPONSIBILITIES OF OPERATORS

Operator must conform with
OSHA 1926.1412 - Modified, altered and / or repaired cranes
OSHA 1926.1413 - Wire rope inspections
OSHA 1926.1414 - Wire rope—selection and installation criteria
OSHA 1926.1417 - Operation
OSHA 1926.1418 - Authority to stop operation
OSHA 1926.1422 - Signals—hand signal chart
OSHA 1926.1423 - Fall protection
OSHA 1926.1434 - Equipment modifications
ANSI B30.5:2011 5.2.3 - Crane maintenance
ANSI B30.5:2011 5.2.4 - Rope maintenance

8.1. BASIC PRINCIPLES.

The information in this standard shall be supplemented by good judgment, safety control, and caution in evaluating each situation. Since the operator is in direct control of the aerial platform, conformance with good safety practices in this area is the responsibility of the operator. The operator shall make decisions on the use and operation of the aerial platform with due consideration for the fact that his or her own safety as well as the safety of others is dependent on those decisions.

8.2. MANUALS

8.2.1. MACHINE MANUALS.

The operator shall ensure the operating and maintenance manuals are stored in the weather resistant storage compartment on the aerial platform. The manual(s) is considered an integral part of the aerial platform and is vital to communicate necessary safety information to the operator. The operator shall be familiar with the manuals and reference them as required.

8.2.2. MANUAL OF RESPONSIBILITIES.

The operator shall be familiar with the requirements for operators as set forth in Section 8 of the Manual of Responsibilities for Dealers, Owners, Users, Operators, Lessors, Lessees and Brokers of Boom-Supported Elevating Work Platforms. The current Manual of Responsibilities shall be kept with the aerial platform at all times and stored in the weather-resistant compartment when not in use.

8.3. PRESTART INSPECTION.

Before use each day or at the beginning of each shift, the aerial platform shall be given a visual inspection and functional test including, but not limited to, the following:
(1) Operating and emergency controls;
(2) Safety devices;
(3) Personal protective devices;
(4) Air, hydraulic and fuel system(s) leaks;
(5) Cables and wiring harness;
(6) Loose or missing parts;
(7) Tires and wheels;
(8) Placards, warnings, control markings and operating manual(s);
(9) Outriggers, stabilizers, extendable axles and other structures;
(10) Guardrail system;
(11) Items specified by the manufacturer.

8.4. PROBLEMS OR MALFUNCTIONS.

Any problems or malfunctions that affect the safety of operations shall be repaired prior to the use of the aerial platform.

8.5. TRAINING, RETRAINING, AND FAMILIARIZATION

8.5.1. GENERAL TRAINING.

Only personnel who have received general instructions regarding the inspection, application and operation of aerial platforms, including recognition and avoidance of hazards associated with their operation, shall operate an aerial platform. Such items covered shall include, but not necessarily be limited to, the following issues and requirements:

(1) the purpose and use of manuals;
(2) that operating manuals are an integral part of the aerial platform and must be stored properly in the weather-resistant compartment when not in use;
(3) a pre-start inspection;
(4) responsibilities associated with problems or malfunctions affecting the operation of the aerial platform;
(5) factors affecting stability;
(6) the purpose of placards and decals;
(7) workplace inspection;
(8) safety rules and regulations;
(9) authorization to operate;
(10) operator warnings and instructions;
(11) actual operation of the aerial platform.

Under the direction of a qualified person, the trainee shall operate the aerial platform for a sufficient period of time to demonstrate proficiency in the actual operation of the aerial platform.

8.5.2. RETRAINING.

The operator shall be retrained, when so directed by the user, based on the user's observation and evaluation of the operator.

8.5.3. FAMILIARIZATION.

When an operator is directed to operate an aerial platform he/she is not familiar with, the operator shall receive instructions regarding the following items:

(1) The location of the weather resistant compartment (for manual(s) storage);
(2) The purpose and function of all controls;
(3) Safety devices and operating characteristics specific to the aerial platform.

8.6. BEFORE OPERATION.

Before operation, the operator shall:

(1) Read and understand the manufacturer's operating instruction(s) and user's safety rules, or have them explained;
(2) Understand all labels, warnings, and instructions displayed on the aerial platform or have them explained;
(3) Ensure all occupants of the aerial platform wear appropriate personal protective equipment (PPE) for the conditions, including the environment in which the aerial platform will be operated

8.7. WORKPLACE INSPECTION.

Before the aerial platform is used and during use, the operator shall check the area in which the aerial platform is to be used for possible hazards such as, but not limited to:

(1) Drop-offs or holes, including those concealed by water, ice, mud, etc;
(2) Slope(s);
(3) Bumps and floor obstructions;
(4) Debris;
(5) Overhead obstructions and electrical conductors;
(6) Hazardous locations and atmospheres (reference ANSI/NFPA 505-1987);
(7) Inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating configurations;
(8) Wind and weather conditions;
(9) Presence of unauthorized persons;
(10) Other possible unsafe conditions.

8.8. PRIOR TO EACH OPERATION.

Before each operation of the platform, the operator shall ensure:
(1) Outriggers, stabilizers, extendable axles, or other stability enhancing means, are used as required by the manufacturer;
(2) Guardrails are installed and access gates or openings are closed per manufacturer's instructions;
(3) The load and its distribution on the platform and any platform extension(s) are in accordance with the manufacturer's rated capacity for that specific configuration;
(4) All personnel on the aerial platform have appropriate safety gear for the work and environment envisioned.

8.9. UNDERSTANDING OF HAZARDOUS LOCATIONS.

It shall be the responsibility of the operator to understand the hazard classification of the intended location of operation according to ANSI/NFPA 505-1996.

8.10. OPERATOR WARNINGS AND INSTRUCTIONS.

The operator shall direct personnel operating the aerial platform to be in compliance with the provisions set forth in this standard. The operator shall monitor their performance and supervise their work to ensure the use, application, and operation of the aerial platform is in conformance with the provisions set forth in Section 8 of this standard, warn personnel of potential hazards, provide means to protect against identified hazards, and explain the potential consequences of not following proper operating guidelines. Instructions and guidelines regarding proper operation shall include, but not necessarily be limited to the following issues and subjects:
(1) Fall protection.
While the guardrail system of the aerial platform provides primary fall protection all occupants of the work platform shall wear either fall restraint or fall arrest equipment as directed by their employer.
(2) Slope and grade.
The aerial platform shall not be operated in any manner on grades, side slopes, or ramps exceeding those for which the aerial platform is rated by the manufacturer.
(3) Deployment of stability enhancing means.
Outriggers, stabilizers, extendable axles or other stability enhancing means shall be deployed and locked into place as required by the manufacturer.
(4) Guardrail system.
Guardrails shall be installed and positioned, and access gates or openings shall be properly closed per the manufacturer's instructions.
(5) Distribution of load.
The load and its distribution on the platform and any platform extension(s) shall be in accordance with the manufacturer's rated capacity for that specific configuration.
(6) Maintaining overhead clearance.
The operator shall be instructed to ensure that adequate clearance is maintained from overhead obstructions and energized electrical conductors and parts.
(7) Electrocution hazard.
The operator shall perform only the work for which he or she is qualified, in compliance with all applicable safety related work practices intended to prevent electric shock covered by the Code of Federal Regulations (CFR) 1910.333. The operator's level of competence shall be established only by persons qualified to do so. Operators shall maintain the appropriate minimum approach distance (MAD) from energized power lines and parts covered by CFR 1910.333 (c).
(8) Personal Protective Equipment.
The operator shall ensure all personnel on the platform wear personal protective equipment as required.
(9) Personnel footing.
Personnel shall maintain a firm footing on the platform floor while working thereon. Climbing by occupants on the mid-rail or top-rail of the aerial platform is prohibited. The use of planks, ladders, or any other devices on the platform for achieving additional height or reach is prohibited.
(10) Precaution for other moving equipment.
When other moving equipment and vehicles are present, special precautions shall be taken to comply with local ordinances or safety standards established for the workplace. Warnings such as, but not limited to, flags, roped off areas, flashing lights, and barricades shall be used as appropriate.
(11) Reporting problems or malfunctions.
The operator shall immediately report to a supervisor any problem(s) or malfunction(s) that become

evident during operation. The operator shall ensure all problems and malfunctions that affect the safety of operations are repaired prior to continued use.

(12) Reporting potentially hazardous locations.
The operator shall immediately report to a supervisor any potentially hazardous location(s) that become evident during operation.

(13) Hazardous location operation.
Operation of aerial platforms not approved and marked for operation in a hazardous location shall be prohibited.

(14) Entanglement.
Care shall be taken to prevent rope, electric cords, and hoses, etc., from becoming entangled in the aerial platform.

(15) Capacity limitations.
Rated capacities shall not be exceeded when loads are transferred to the platform at any height.

(16) Work area.
The operator shall ensure the area surrounding the aerial platform is clear of personnel and equipment before lowering the platform.

(17) Fueling.
The engine (if applicable) shall be shut down while fuel tanks are being filled. Fueling shall be done in a well-ventilated area free of flame, sparks, or other hazards that may cause fire or explosion.

(18) Battery charging.
Batteries shall be charged in a well-ventilated area free of flame, sparks or other hazards that may cause fire or explosion.

(19) Improper platform stabilization.
The aerial platform shall not be positioned against another object to steady the platform or improve stability.

(20) Misuse as a crane.
The aerial platform shall not be used as a crane.

(21) Unusual operating support conditions. The aerial platform shall not be operated from a position on trucks, trailers, railway cars, floating vessels, scaffolds, or similar equipment unless the application is approved in writing by the manufacturer or a qualified person.

(22) Travel speeds.
The operator shall limit travel speed according to conditions, including the condition of the support surface, congestion, visibility, slope, location of personnel, and other factors leading to hazards which may cause collision(s) or result in potential injury(ies) to personnel.

(23) Driving requirements.
Before and during driving while the platform is elevated, the operator shall:
(a) Maintain a clear view of the support surface and route of travel;
(b) Ensure personnel in the worksite area that may be affected are aware of the movement, communicating and maneuvering the aerial platform as required to protect against personal injury;
(c) Maintain a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps, and other hazards to ensure safe travel;
(d) Maintain a safe distance from overhead obstacles.

(24) Stunt driving.
Stunt driving and horseplay are prohibited.

(25) Securing the aerial platform.
The operator shall implement means provided to protect against use by an unauthorized person(s).

(26) Altering safety devices.
Interlocks or other safety devices shall not be altered or disabled.

(27) Snagged platform.
If the platform or elevating assembly becomes caught, snagged, or otherwise prevented from normal motion by adjacent structures or other obstacles such that control reversal does not free the platform, all personnel shall be removed from the platform before attempts are made to free the platform using lower controls.

(28) Vacating (or entering) an elevated aerial platform.
If permitted by the manufacturer, personnel shall only vacate or enter a raised aerial platform by following the guidelines and instructions provided by the manufacturer.

(29) Modifications.
Modification or alteration of an aerial platform or the fabrication and attaching of frameworks, or the mounting of attachments for holding tools or materials onto the platform or the guardrail system shall only be accomplished with the prior written permission of the manufacturer.

(30) Assistance to the operator.
If an operator encounters any suspected malfunction of the aerial platform, or any hazard or potentially

unsafe condition relating to capacity, intended use or safe operation of the aerial platform, the operator shall cease operation of the aerial platform and request further information from the operator.

(31) Problem(s) or malfunction(s).
Any problems or malfunctions that affect the safety of operations shall be repaired prior to the use of the aerial platform.

(32) Carrying materials (larger than the platform).
The operator shall ensure that only properly secured tools and materials which are evenly distributed and can be safely handled by a person(s) working from the platform, shall be moved.

(33) Rated horizontal force.
The operator shall not exceed the manufacturer's rated horizontal force.

(34) Bridge cranes or contact with any electrical conductors.
When an aerial platform is to operate within the area of travel of a bridge crane or similar equipment, steps shall be taken to prevent a collision with the aerial platform.

(35) Adequate support requirements.
The operator shall insure the support surface is adequate for the aerial platform and the load carried.

(36) Leveling the aerial platform.
Outriggers and leveling devices supplied by the manufacturer shall be utilized to level the aerial platform when provided.

(37) Protecting against unauthorized use.
The operator shall not use, rent, lease, or provide the aerial platform for any form of beneficial use unless so authorized.

8.11. RECORD OF TRAINING.

When provided or when obtained upon the operator's request, proof of training by the training entity should be retained by the operator. Records shall contain the following information:

(1) Name of entity providing training or retraining;
(2) Name of trainer(s);
(3) Clear identification that training covered Boom-Supported Elevating Work Platforms;
(4) Date of training;
(5) Name of trainee.

9. RESPONSIBILITIES OF LESSORS

9.1. BASIC PRINCIPLES.

Sound principles of safety, training inspections, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the performance of responsibilities of lessors with due consideration of the knowledge that the aerial platform will be carrying personnel.

9.2. LESSOR AS A DEALER.

When a lessor uses the aerial platform as a dealer, the lessor shall have the responsibilities of dealers as specified in Section 5 of this standard.

9.3. LESSOR AS AN OWNER.

When a lessor uses the aerial platform as an owner, the lessor shall have the responsibilities of owners as specified in Section 6 of this standard.

9.4. LESSOR AS A USER.

When a lessor uses the aerial platform as a user, the lessor shall have the responsibilities of users as specified in Section 7 of this standard.

9.5. LESSOR AS AN OPERATOR.

When a lessor uses the aerial platform as an operator, the lessor shall have the responsibilities of operators as specified in Section 8 of this standard.

10. RESPONSIBILITIES OF LESSEES

10.1. BASIC PRINCIPLES.

Sound principles of safety, training, inspections, maintenance, application, and operation consistent with all data available regarding the parameters of intended use and expected environment shall be applied in the performance of responsibilities of lessees with due consideration of the knowledge that the aerial platform will be carrying personnel.

10.2. LESSEE AS A DEALER.

When a lessee uses the aerial platform as a dealer, the lessee shall have the responsibilities of dealers as specified in Section 5 of this standard.

10.3. LESSEE AS AN OWNER.

When a lessee uses the aerial platform as an owner, the lessee shall have the responsibilities of owners as specified in Section 6 of this standard.

10.4. LESSEE AS A USER.

When a lessee uses the aerial platform as a user, the lessee shall have the responsibilities of users as specified in Section 7 of this standard.

10.5. LESSEE AS AN OPERATOR.

When a lessee uses the aerial platform as an operator, the lessee shall have the responsibilities of operators as specified in Section 8 of this standard.

11. RESPONSIBILITIES OF BROKER

11.1. RESPONSIBILITIES UPON SALE.

The broker shall:
(1) upon delivery, ensure the operating and maintenance manuals are provided to the new owner;
(2) upon delivery, provide a copy of the current Manual of Responsibilities to the new owner;
(3) maintain records of the sale for a minimum of four (4) years

12. MAINTENANCE

12.1. REQUIREMENTS

DANGER:
- **Do not allow unauthorized personnel to operate on the machine.**
- **Do not carry out any operation without prior authorization.**
- **All maintenance operations must be carried out with the machine stopped, as well as the motors and the hydraulic system depressurized.**
- **Comply with the provided procedures for maintenance and technical assistance.**
- **Do not use the controls or flexible pipes as hooks to climb or get down from the machine.**
- **Always block the parts of the machine that must be lifted to carry out operations by staying underneath.**
- **Do not pass under or below the lifted machine.**
- **Use harness or similar with suitable capacity to lift or transport heavy.**
- **Ensure that the harness is made by the book.**
- **Do not wear bracelets, watches, rings or clothes that are not laced as they can get caught in the moving parts.**
- **Do not use the combustion motor indoors without suitable ventilation to prevent the concentration of harmful gases.**
- **Never use fuel, solvents or other flammable liquids, such as detergents; use instead authorized, non-flammable and non-toxic marketed solvents.**

12.2. INTRODUCTION

ATTENTION:
Refer to the periodic maintenance table indicating the scheduled intervals at the end of this chapter.

A good maintenance and a proper use ensure the platform performance and safety.

To ensure a constant and regular operation of the platform (EWP) and prevent the invalidation of the warranty, every part must be replaced with Cormidi Srl original spare parts.

The purchased or rented platform has been tested in the factory and it has been serviced, immediately before delivery, to ensure the proper start-up of the platform (EWP), having performed all the required checks and registrations.

12.3. INSPECTIONS CARRIED OUT BY THE MANUFACTURE

The inspections carried out by the manufacturer are:

- before commissioning the platform (EWP)

1 - verification of the hydraulic oil level
2 - greasing the runners
3 - greasing the hinge pins
4 - greasing the rotation apparatus

- with the platform (EWP) running

5 - calibration of the pressure limiting valves
6 - calibration of the block valves
7 - calibration of the interlock and safety devices
8 -- verification of oil leakage in the hydraulic system
9 -- verification of general operation
10 --application of all the plates.

12.4. HYDRAULIC OIL INDICATOR

fig. 12.4.1

Inside the motor bonnet, on the right, there is a double indicator for the hydraulic oil.

It allows controlling two values:

1) oil temperature inside the tank with a double temperature scale, °F and °C,

2) the level of the hydraulic oil in the tank.

12.5. VERIFICATION OF THE HYDRAULIC OIL LEVEL

ATTENTION:
Respect the environment and comply with the standards in force when disposing of the oil and filters.

Every 8 hours
Under the protective guard, on the top, in front of the motor, there is the cap for refilling the hydraulic oil and the filter.

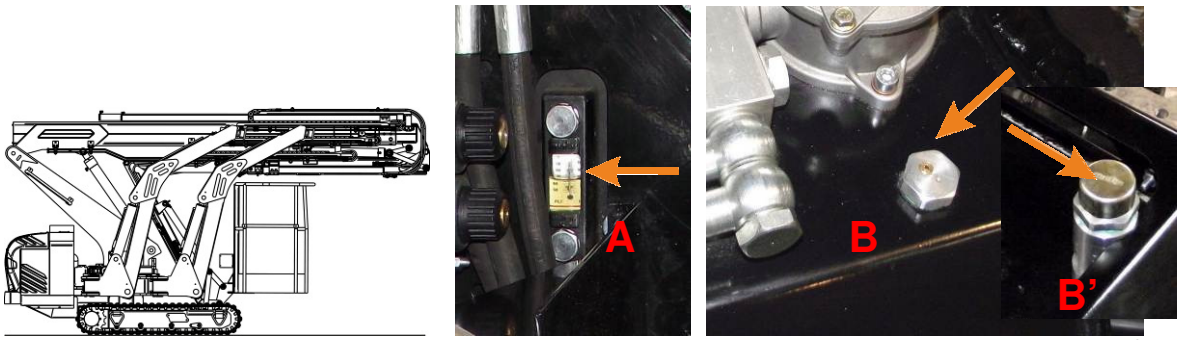


fig. 12.5.1

When **verifying the level** of the hydraulic oil, ensure that the platforms and outriggers are resting on a flat surface.

Verify the oil level from indicator "**A**"; the oil must reach half the level indicator.

Otherwise, top up using specific oil from the **B** cap or **B'** cap of the extension column, if present.

The oil characteristics are described in the tables in Para 12.24.

12.6. REPLACING THE HYDRAULIC OIL

Every 1000 hours or every 2 years anyway.
When the **hydraulic oil must be replaced**, discharge the exhaust oil by loosening the cap under the machine, on the right side of the motor bonnet (see following figures).

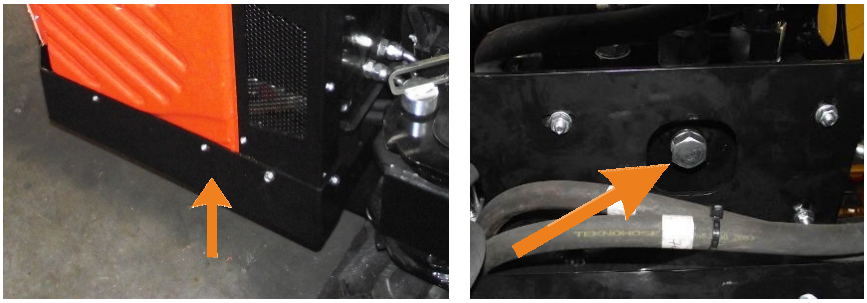


fig. 12.6.1

Discharge the tank completely. The fill with specific oil (see tables at the end of the chapter) and verify the oil level as previously described.

ATTENTION:
Respect the environment and comply with the standards in force when disposing of the oil.

12.7. REPLACING THE FILTERING CARTRIDGE OF THE HYDRAULIC OIL

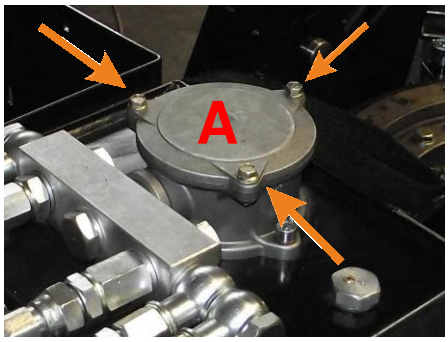


fig. 12.7.1

Every 500 hours
Under the protective guard, on the top, in front of the motor bonnet there is the filtering cartridge of the hydraulic oil, which must be replaced periodically, always when the hydraulic oil is changed.

For the replacement, proceed as follows:

1) Loosen the screws that fasten cap "**A**" and remove the filtering cartridge.
2) Replace the cartridge with a new one having the same characteristics.
3) Place the cap "**A**" again.

12.8. VERIFICATION OF LEAKS INSIDE THE HYDRAULIC SYSTEM

Every 8 hours
Visually inspect all the flexible pipes, fittings and all the other components of the hydraulic system, in order to detect any possible leakage.

Normally, leaking pipes can be removed by properly tightening the fittings (see table Para 12.25).

Leakages in the sealing zone with gaskets (o-ring, sealing rings, etc.) cannot be removed by simply tightening, as the gasket leaks because damaged or hardened.
The seal can be restored only by replacing the gasket.

12.9. VERIFICATION OF THE PROPER OPERATION OF THE CONTROLS.

Every 8 hours
Ensure that the ground controls on the work platform and the emergency ones activate gently and easily and that the levers automatically return to the center.

Ensure that the lever protection devices are not bended, preventing the proper operation of the control.

12.10. VERIFICATION OF THE LOAD LIMITER OPERATION

Every 8 hours
Ensure that the load limiter safety device activates in case it is required.

1 Take the platform cage close to the ground, with maximum horizontal extension.
2 Place weights 10% heavier than the maximum allowed (see work diagram) inside the platform.
3 The machine blocks and the acoustic alarm activates.
4 Remove the testing weight.
5 Restore the operation by restarting the platform.

ATTENTION:
In case of malfunctions, refer to the manufacturer or authorized workshop to detect and repair the failure.

Do not use the machine if the load limiter safety device does not work properly!

12.11. VERIFICATION OF THE OIL INSIDE THE TRACK REDUCERS

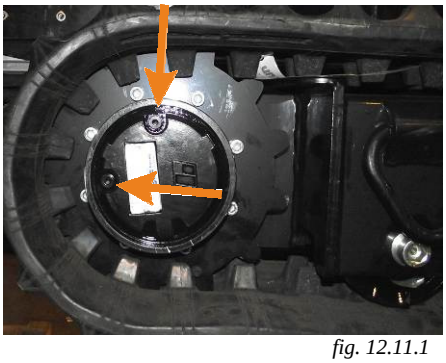


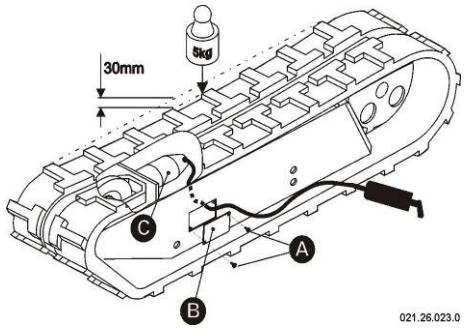
fig. 12.11.1

Every 100 hours
Stop the gearmotor by placing the caps in position, as shown in the figure on the side.
Remove the caps; if oil emerges from the central hole, the level inside the reducer is correct. If this does not happen, pour the oil (see tables at the end of the chapter) until it comes out from the central hole.
Every 1000 hours Replace the reducer oil
Replace the hydraulic oil of the reducers discharging the residual oil first; for this operation, the top hole, in fig. 12.11.1, must be found on the bottom. Use the container to recover the exhaust oil.

Comply with the standards in force; never dispose of the exhaust oils.

12.12. VERIFICATION OF THE TRACK TENSION

Every 100 hours
Stop the machine on a flat and solid surface and lift the side to be adjusted.



021.26.023.0 *fig. 12.12.1*

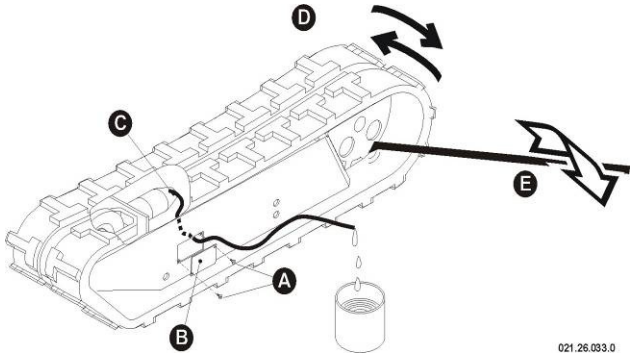
The correct track tension is important to guarantee its duration: to verify it, apply a 11 lbf (5 kg force) on the track, at half its length, and ensure that the arrow does not exceed 1.2 inch (30 mm) (see fig. 12.12.1).
To adjust the track tension correctly:

- Remove cover "**B**" loosening screws "**A**";
- By using a specific hydraulic greaser, refill tank "**C**" of grease, until reaching a pressure of about 200 bar;
- Ensure that the arrow is about 1.2 inch (30 mm);
- Remount the cover;

Repeat the same operations for the other track.

12.13. REPLACING THE TRACK

DANGER:
never operate when the machine is resting on jacks or suspended. Always place it on lifting jacks suitable for supporting the machine weight, before starting the operations.



021.26.033.0 *fig. 12.13.1*

To replace the tracks, follow the procedure below:

- Lift the side of the machine involved by using hydraulic jacks or a crane;
- Place the machine, ensuring it is stable;
- Remove cover "**B**" loosening screws "**A**";
- Loosen greaser "**C**" and discharge the grease. The track will loosen;
- To remove the track"**D**", as indicated in fig.12.13.1, place a lever "**E**" between the track and drive wheel, making the latter rotate forward or backward, until the track is removed from its housing;
- Remount the track matching it with the driving wheel teeth;
- Fit the front part of the track on the front idle wheel with a slight rotation;
- Adjust the track tension;
- Ensure that the arrow is about 0.4÷0.6" (10÷15 mm);
- Remount the cover.

12.14. GREASING

Every 200 hours **Grease the roller bearing unit**

Refill all the greasers on the machine using the specific pump (see also fig. 12.23.1 "Lubrication diagram").

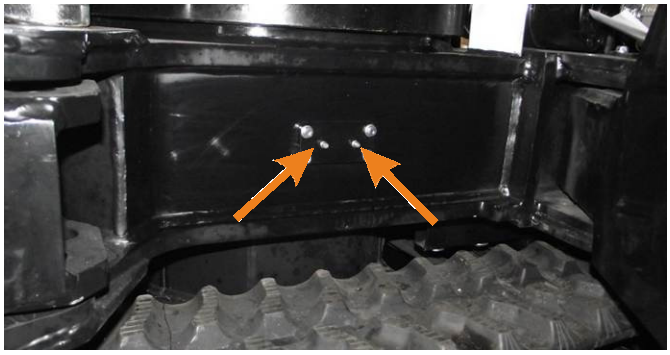


fig. 12.14.1

The greasers on the left side of the carriage allow restoring the turret roller bearing lubrication.

12.15. GREASING THE TELESCOPIC RETRACTING ARMS

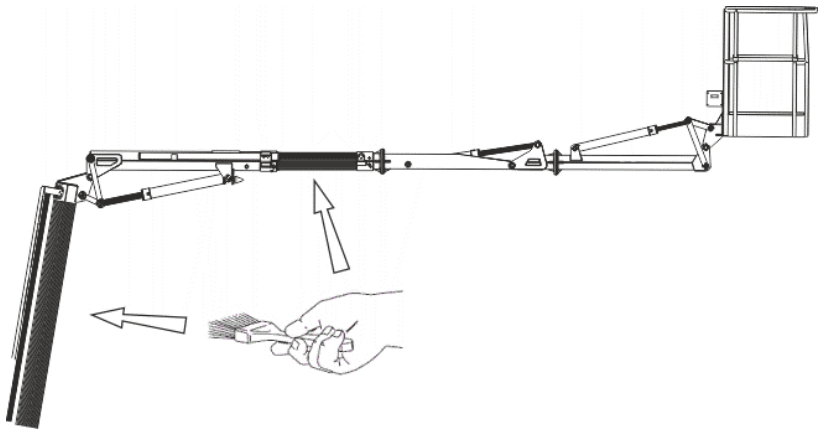


fig. 12.15.1

Every 100 hours

Apply grease on the sliding part of the telescopic arm using a brush (see tab. 12.24.1).
The mobile parts must be properly lubricated to ensure the safe operation of the platform.

12.16. VERIFICATION OF THE WEAR OF THE TELESCOPIC ARM RUNNERS

Every 100 hours

The pins on the head of the retraction arms push the pads, made of special anti-friction material, on the telescopic arms. Each side is equipped with 4 pins for each retraction arm.
Ensure that there is no play on the retraction arm heads, every 100 hours.

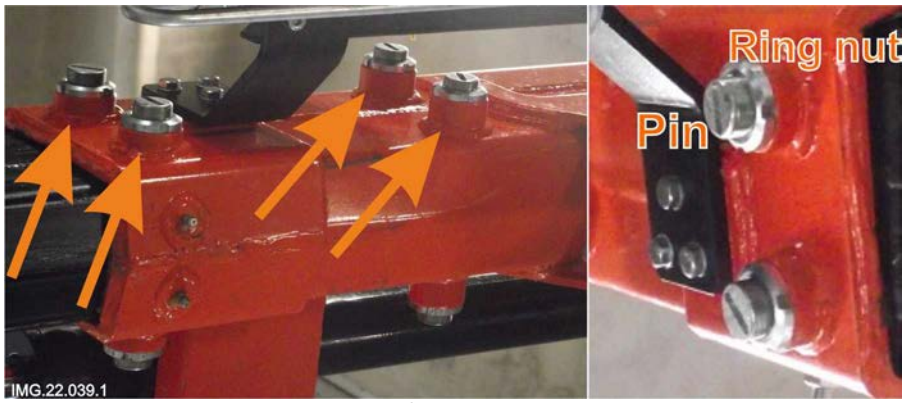


fig. 12.16.1

Grab the cage sideways, with the platform open and the cage almost on the ground.

If play is noticed by making it oscillating sideways, tighten the pins of the telescopic retraction arms to solve the problem.

- The pin head must not touch the ring nut on the frame (see fig.12.16.1).
- In the event the pin head touches the ring nut, it means that the pad is worn and it must be replaced.
- The runners must be replaced at Cormidi Srl authorized workshops.

12.17. VERIFICATION OF THE PRESENCE AND INTEGRITY OF THE PLATES ON THE MACHINE

Every 200 hours

Verify the presence and readability of the prohibition, danger and control plates placed on the machine.

Refer to Para 2.9 to identify any missing or damaged plates.

12.18. VERIFICATION OF THE FASTENING SCREWS TIGHTENING OF THE PIN-STOPPERS AND RING-NUTS

Every 200 hours

Verify that the fastening screws of the pin-stoppers and ring-nuts are not loosened.
If so, tighten the screws or the ring-nuts.

12.19. VERIFICATION OF THE FASTENING SCREW TIGHTENING THE ROTATING TURRET

Every 200 hours

Verify that the turret fastening screws (see fig. 12.19.1), which allow the rotation of the main arm of the platform, are not loosened and properly tightened.
If so, tighten the screws or the ring-nuts.

Remove the plastic protection devices fastened to the turret side.

By using a torque wrench, the tightening torque of the pins must be within: 205 ÷ 215 Nm.

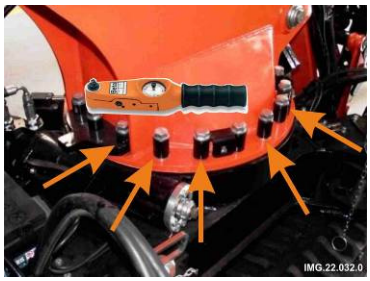


fig. 12.19.1

12.20. VERIFICATION OF THE HYDRAULIC SYSTEM OPERATING PRESSURE

Every 200 hours

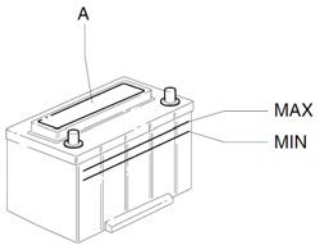
The inspection must be carried out at a Cormidi Srl Technical Assistance Center.

12.21. BATTERY: INSPECTIONS AND MAINTENANCE

ATTENTION:

- **Never place flames or create sparks close to the battery (explosive gas).**
- **The battery contains dilute sulfuric acid, which is highly corrosive.**
- **Therefore, take all the precautions required protecting eyes and face.**
- **In the event of accidental contact with the skin, immediately rinse with plenty of water.**

12.21.1. VERIFICATION OF THE ELECTROLYTE



The battery does not require top ups. However, should the electrolyte level be below the minimum level (MIN) with the machine in horizontal position, it can be restored by removing cover "A" and adding distilled water without exceeding the maximum level (MAX).

Note
If the period of inactivity exceeds one month, we recommend to isolate the battery
- Remove the terminals from the battery, always starting from the negative pole (-).
- Reconnect the electric cables, always starting from the positive pole (+).

12.21.2. REPLACING THE BATTERY

ATTENTION:
- Do not disconnect the cables when the motor is running.
- Remove the terminals from the battery, always starting from the negative pole (-).
- Reconnect the electric cables, always starting from the positive pole (+).

Replace the battery with a new one with the same characteristics, when this does not accumulate electricity anymore.

See the characteristic table on the battery.

ATTENTION:
Respect the environment and comply with the standards in force when disposing of the exhaust batteries.

12.22. PERIODICAL INSPECTIONS AND MAINTENANCE

The following table indicates the schedule of the machine maintenance.
Symbol key:

■ operations to be carried out by the operator

★ operations to be carried out in an authorized workshop or at the manufacturer's premises

Note
For maintenance operations of the combustion motor, comply with that described in the relative instruction manual.

Maintenance table

Operation description	8 hours	100 hours	200 hours	500 hours	1000 hours	4000 hours
Control of the hydraulic oil level	■					
Visual inspection of the leaks inside the hydraulic system	■					
Verification of the proper operation of the controls	■					
Verification of the correct operation of the safety devices	■					
Verification of the load limiter operation	■					
Verification of the oil inside the track reducers		■				
Verification of the track tension		■				
Verification of the rotation unit lubrication			■			
Greasing the hinge pins and grease refilling of all the greasers	■					
Verify the presence and integrity of all the plates on the machine			■			
Verification of the fastening screws tightening of the pin-stoppers and ring-nuts			■			
Verify the wear state of the runners of the telescopic arm			✶			
Verification of the pollution state of the hydraulic oil			✶			
Verification of the cartridge of the hydraulic oil filter		■				
Verification of the state of the rubber tracks	■					
Greasing the retraction arms and runners of the telescopic arm		■				
Washing and cleaning the machine					■	
Replacement of the cartridge of the hydraulic oil filter				✶^		
Replacement of the oil inside the track reducers					✶	
Verification of the platform structure					■	
Replacing the hydraulic oil					✶^	
Washing the hydraulic system					✶	
Replacing the connection cables						✶
Replacing the jack gasket						✶
Verification of the fastening screws tightening the rotating turret			■			

^ or at least every 2 years.

12.23. LUBRICATION GENERAL DIAGRAM

General diagram, see details in the maintenance paragraphs.

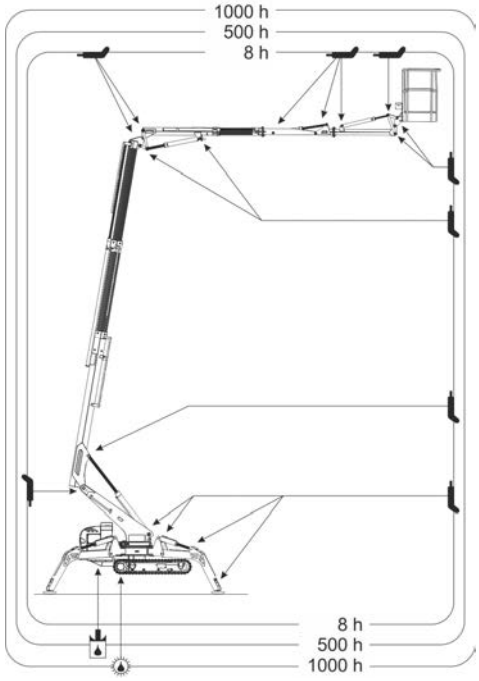


fig. 12.23.1

Symbol key:

Replacing the hydraulic oil filter

Greasing

Changing the reducer oil

12.24. LUBRICANT TABLES

The tables below refer to types of oils and lubricants that we recommend for ambient operating temperatures from –4 °F to +122 °F (–20 °C to +50 °C).

	Type	Quantity
Motor Oil	**15W - 40**	**1,1 lt**
Hydraulic Oil	**ISO 32 high performance**	**35 lt**
Grease	**Molybdenum disulfide grease for high loads**	**q.b.**

tab. 12.24.1

For the reducers, we recommend oils for gears with E.P. additive with class of viscosity according to ISO VG150 or SAE 80W/90.
In presence of important differences in temperature, we recommend using synthetic EP lubricants, with 165 minimum viscosity rate and class of viscosity VG150 e VG220.

	VG100	**VG150**	**VG320**	**VG150-200**
ISO 3448	-4 °F ÷ 41 °F -20 °C ÷ 5 °C IV 95min	41 °F ÷ 104 °F 5 °C ÷ 40 °C IV 95min	86 °F ÷ 122 °F 30 °C ÷ 50 °C IV 95min	-22 °F ÷ 149 °F -30 °C ÷ +65 °C IV 165min

tab. 12.24.2

12.25. TIGHTENING TORQUE TABLE

Diameter mm	Diameter inch	Thread	Tightening Torque [Nm]
6		7/16 - 20	13 – 15
8		1/2 - 20	18 – 25
10		9/16 - 18	24 – 31
12		3/4 – 16	45 – 52
14		7/8 – 14	65 – 72
15			
16	5/8		
18	3/4	1”1/16 – 12	92 – 100
20			
22		1”3/16 – 12	118 – 130
25	1”	1”5/16 – 12	127 – 145
30		1”5/8 – 12	175 – 190
32	1”1/4		
38	1”1/2	1”7/8 – 12	215 - 240

tab. 12.25.1

12.26. PERIODICAL MAINTENANCE SCHEDULE

The following table must be filled by the maintenance operators to verify the periodical maintenance performed and highlight the operations that must be performed in accordance with the maintenance schedule.

Type of maintenance	Date	Operator

12.27. TROUBLESHOOTING

what is not working	*on what it depends*
Arm Lift 1	Excessive cage inclination > 5° Radio Mode if arm angle > 25° Arm 1 Angle Alarm Outrigger Leveling Alarm Disconnected Pressure Switch Alarm High pressure of the main circuit > 240 bar
Arm Lift 2	Excessive cage inclination > 5° Radio Mode and retraction arm still pressed Arm 1 Angle Alarm Outrigger Leveling Alarm Disconnected Pressure Switch Alarm High pressure of the main circuit > 240 Bar Overload Limiter > 110% only in EWP
Arm Lower 2	Excessive cage inclination > 5° Limiter block Radio Mode and retraction arm still pressed Arm 1 Angle Alarm Outrigger Leveling Alarm Disconnected Pressure Switch Alarm
Arm Return 2	Excessive cage inclination > 5° Outrigger Leveling Alarm
Arm Retraction 2	Excessive cage inclination > 5° Limiter block Radio Mode Arm 1 Angle Alarm Outrigger Leveling Alarm Disconnected Pressure Switch Alarm
Arm Return 1	Excessive cage inclination > 5° Outrigger Leveling Alarm
Arm Retraction 1	Excessive cage inclination > 5° Limiter block Radio Mode and arm angle < 54° Radio Mode and arm angle > 55° and free retraction arm micro switches Arm 1 Angle Alarm Outrigger Leveling Alarm Disconnected Pressure Switch Alarm Cage Mode and arm angle < 25°
Jib Ascend	Excessive cage inclination > 5° Arm 1 Angle Alarm Outrigger Leveling Alarm Disconnected Pressure Switch Alarm
Jib Descend	Excessive cage inclination > 5° Limiter block Arm 1 Angle Alarm Outrigger Leveling Alarm Disconnected Pressure Switch Alarm

13. SPARE PARTS AND ACESSORIES

13.1. ASSISTANCE

For any information on use, maintenance, installation, etc of the elevating work platform (EWP), refer to Cormidi Srl.
The Customer must place the questions clearly, possibly referring to this Operating Manual.

13.2. SPARE PARTS

For any spare parts, refer to the relative catalogue or contact Cormidi Srl.

Always use original spare parts only.

N.B. Cormidi srl is not liable for breakage, malfunction or damage to persons or objects due to the use of non-original spare parts.

13.3. ACCESSORIES

As for the accessories supplied with the elevating work platform (EWP) always refer to Cormidi srl.

14. ADDITIONAL INSTRUCTIONS

14.1. WASTE DISPOSAL

ATTENTION:
All waste materials deriving from the machine maintenance must be disposed of according to the standards and laws in force in the Country where the machine is installed, in full respect with the environment and safety.

14.2. DECOMMISSIONING AND DISMANTLING

At the end of its lifespan, the machine must not be disposed of together with the municipal waste.

Plastic parts, Electrical panel, electric and electronic components must be disposed of separately in compliance with the Standards in force in the Country where the machine is installed.

As for the metal structure, separate the steel parts from those made of other metals or alloys, in order to be correctly melted during recycle.

A separate disposal allows avoiding possible negative consequences for the environment and health; moreover, it allows recovering the materials, obtaining a considerable resources saving.

It is also important to discharge the hydraulic circuit under pressure, remove the exhaust oil from the hydraulic oil tank, hydraulic jacks, combustion motor and reducers of the tracked undercarriage.

14.3. SAFE WORK PROCEDURES

The operators in charge must be trained and informed on the specific procedures for:

- Using the Equipment/Electrical Panel safely;
- Emergency situations.
- Specific special procedures (instructions provided by the responsible of the operations for specific uses: e.g., plat pruning, film shooting lights installation, etc.)

15. ATTACHMENTS

15.1. MACHINE DRAWERS

---- see annexes ----

15.2. ELECTRICAL DIAGRAMS

---- see annexes ----

15.3. HYDRAULIC DIAGRAMS

---- see annexes ----

CORMIDI leadinginnovation

CORMIDI S.R.L.
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84069 ROCCADASPIDE–SALERNO
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DICHIARAZIONE CE DI CONFORMITA'
EC DECLARATION OF CONFORMITY

Il sottoscritto, detentore della documentazione tecnica, dichiara che la sottoindicata macchina è stata progettata e costruita in conformità alle seguenti Direttive Europee, come emendate, alle norme armonizzate citate e ai decreti e regolamenti che le trasp[illegible] nelle leggi nazionali:

The undersigned, holder of the technical docume[illegible], declare that the machine described below has benn designed and manufactured in compliance [illegible] following European Directives, as amended, the European Standards and the regulations transposing th[illegible] national laws:

FAC SIMILE

1. 2006/42/CE "SICUREZZA DELLE MACHINE/SAFET[illegible]"	
1.1. PROCEDURA DI VALUTAZIONE DELLA CO[illegible] CONFORMITY ASSESSMENT PROCE[illegible]	ALLEGATO IX (DIR.200642/CE)
1.2. NOME ED INDIRIZZO DELL'ORGAN[illegible] NAME AND ADDRESS OF THE N[illegible]	ICE IST. CERTIFICAZIONE EUROPEA SPA (N. 0303) – ITALY VIA GARIBALDI 20 – 40011 ANZOLA DELL'EMILIA (BO)
1.3. NORME EUROPEE ARM[illegible] LA CONFORMITÀ È DICHIARATA EUROPEAN HARMONISED[illegible] WHICH CONFORMITY IS DECLARED:	EN 12999:2009
2. 2006/95/CE "B[illegible]ENSIONE/LO[illegible]GE"	
3. 2000/[illegible]E "EM[illegible]NE A[illegible]TICA/NOISE EMISSION"	
3.1 LI[illegible] RA MISURATO LWA (RIF. 1 PW) MEA[illegible] POWER LEVEL LWA (REF. 1 PW)	100 dB (A)
[illegible] SONORA GARANTITO LWA (RIF. 1 PW) [illegible] SUOND POWER LEVEL LWA (REF. 1 PW)	101 dB (A)
3.3. [illegible]ENZA [illegible]TA MOTORE INSTALLATA (COME DEFINITA DALLA DIRETTIVA 97/68/CE) [illegible] NET INSTALLED POWER (AS DEFINED BY THE EUROPEAN DIRECTIVE 97/68/CE)	9,5 kW
4. 2004/108/CE "COMPATIBILITÀ ELETTROMAGNETICA/ELECTROMAGNETIC COMPATIBILITY"	
4.1. NORME EUROPEE ARMONIZZATE NEL CUI RISPETTO LA CONFORMITÀ È DICHIARATA EUROPEAN HARMONISED STANDARDS UNDER WHICH CONFORMITY IS DECLARED	EN 13309:2000
5. ALTRE DIRETTIVE APPLICABILI / OTHER APPLICABLE DIRECTIVE/S: _____	
6. COSTRUTTORE/MANUFACTURER: CORMIDI S.R.L. – VIA FONTE 342 – 84069 – ROCCADASPIDE – SALERNO	
7. MACCHINA / MACHINE:	PIATTAFORMA-GRU IDRAULICA SEMOVENTE / HYDRAULIC SELF-PROPELLED AERIAL PLATFORM-CRANE
8. TIPO/TYPE: KB 19	**9. MATRICOLA N°/ SERIAL N°**
10. ANNO DI COSTRUZIONE CONSTRUCTION YEAR 2012	
11. PERSONA AUTORIZZATA A COSTITUIRE IL FASCICOLO TECNICO PERSON AUTHORISED TO COMPILE THE RELEVANT TECHNICAL DOCUMENTATION	ARMANDO CORMIDI VIA FONTE 342 – 84069 ROCCADASPIDE (SA)

DICHIARAZIONE N° *****/12

ROCCADASPIDE

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UCB_F_12.02 2012-02

America

CERTIFICATE

No. U8 13 01 82908 001

Holder of Certificate: **Cormidi S.r.l**
Via Fonte, n°342
84069 Roccadaspide SA
ITALY

Production Facility(ies): 82908

Certification Mark:

Product: **Elevating platform**
Boom supported elevating work platform

Model(s): **KB 19**
KB 22

Parameters: Rated Input Voltage: 120 V AC
Rated Input Frequency: 60 Hz
(see certificate attachment for additional ratings)

Tested according to: CSA 354.1:2004

The product was voluntarily tested according to the relevant safety requirements noted above. It can be marked with the certification mark above. The mark must not be altered in anyway. This product certification system operated by TÜV SÜD America Inc. most closely resembles system 3 as defined in ISO/IEC Guide 67. Certification is based on the TÜV SÜD "Testing and Certification Regulations". TÜV SÜD America Inc. is an OSHA recognized NRTL and a Standards Council of Canada accredited certification body.

Test report no.: DI1210372-000

Date, 2013-01-29

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UCB_F_12.02 2012-02

America

Attachment to Certificate U8 13 01 82908 001

Cormidi S.r.l.
Via Fonte n° 342
84069 Roccadaspida (SA), Italy

Rating Information:

Maximum permissible load: 250 kg / 501 lbs. as an aerial lift with basket
As a crane without platform basket = 995 kg / 2194 lbs (minimum radius)
Maximum # of Operators: 2
Max outreach on the cage 10,7 m / 35,1 ft
Arm up work zone (80 kg / 176,4 lb): 11,2 m / 36,7 ft
Arm up work zone (200 kg / 441 lb): 9.5 m / 31.1ft
Arm up work zone (250 kg / 551 lb): 9 m / 29.5 ft
Turret rotation: 365° non-continuous
Development up to platform height cage 20 m / 65.6 ft
Max working height: 22 m / 72.2 ft
Weight without operator: 3100 kg / 6834 lb (2685kg / 5920 lb crane conf.)
Hydraulic tank capacity: 35 lt / 9.25 gal.
System pressure: 240 bar
Maximum gradient: 10° in the drive direction
Max wind speed: 12.5 m/sec / 28 mph
Electric system voltage: 12 V
Max horizontal load: 90 lbs.
Maneuvering speed: 0.3 m/sec / 0.67 mph
Maximum tilt frame admitted = 1°
Traction: tracked with negative brake
Max offset speed: 0 – 1.93 mph
Outriggers: with electronic control

Engine:
- Internal combustion engine: Honda iGX 440 with electronic control

- Electro-pump with the following characteristics:
Electrical connection: V 220 / V 110; Frequency: 50 / 60 Hz , 2.2 kW

Dimensions:
Track width = 35.43"
Track length = 44.48"
Outriggers (front – back) = 161.4"
Outriggers (left – right) = 161.4"
Stabilizer pads 11.8" X 11.8"
Outrigger foot 4.72" circumference
Maximum lift capacity: 2194 lbs (minimum radius)
Maximum slope 10° up slope, 4° degree side slope
Ground contact pressure: 5060 ft. lbs.
Maximum boom length 30 ft. – 35 ft with mechanical extender
Slewing speed: 1 rev/1.11 second (rabbit), 1 rev / 1.22 (turtle)
Noise level: 90 db (A)

Test Report No: DI1210372-000

Date, 2013-01-29
B 13 01 82908 001

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UCB_F_12.02 2012-02

America

CERTIFICATE

No. U10 13 01 82908 002

Holder of Certificate: **Cormidi S.r.l**
Via Fonte, n°342
84069 Roccadaspide SA
ITALY

Production Facility(ies): 82908

Certification Mark:

Product: **Elevating platform**
Boom supported elevating work platform

Model(s): **KB 19**
KB 22

Parameters: Rated Input Voltage: 120 V AC
Rated Input Frequency: 60 Hz
(see certificate attachment for additional ratings)

Tested according to: ANSI B30.5:2011
ANSI/SIA A92.5:2006

The product was voluntarily tested according to the relevant requirements noted above. It can be marked with the certification mark above. The mark must not be altered in anyway. The certificate holder shall not transfer this certificate to third parties. This product certification system operated by TÜV SÜD America Inc. most closely resembles system 3 as defined in ISO/IEC Guide 67. Certification is based on the TÜV SÜD "Testing and Certification Regulations".

Test report no.: DI1210372-000

Date, 2013-01-29

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UCB_F_12.02 2012-02

America

Attachment to Certificate U10 13 01 82908 002

Cormidi S.r.l.
Via Fonte n° 342
84069 Roccadaspida (SA), Italy

Rating Information:

Maximum permissible load: 250 kg / 501 lbs. as an aerial lift with basket
As a crane without platform basket = 995 kg / 2194 lbs (minimum radius)
Maximum # of Operators: 2
Max outreach on the cage 10,7 m / 35,1 ft
Arm up work zone (80 kg / 176,4 lb): 11,2 m / 36,7 ft
Arm up work zone (200 kg / 441 lb): 9.5 m / 31.1ft
Arm up work zone (250 kg / 551 lb): 9 m / 29.5 ft
Turret rotation: 365° non-continuous
Development up to platform height cage 20 m / 65.6 ft
Max working height: 22 m / 72.2 ft
Weight without operator: 3100 kg / 6834 lb (2685kg / 5920 lb crane conf.)
Hydraulic tank capacity: 35 lt / 9.25 gal.
System pressure: 240 bar
Maximum gradient: 10° in the drive direction
Max wind speed: 12.5 m/sec / 28 mph
Electric system voltage: 12 V
Max horizontal load: 90 lbs.
Maneuvering speed: 0.3 m/sec / 0.67 mph
Maximum tilt frame admitted = 1°
Traction: tracked with negative brake
Max offset speed: 0 – 1.93 mph
Outriggers: with electronic control

Engine:
- Internal combustion engine: Honda iGX 440 with electronic control

- Electro-pump with the following characteristics:
Electrical connection: V 220 / V 110; Frequency: 50 / 60 Hz , 2.2 kW

Dimensions:
Track width = 35.43"
Track length = 44.48"
Outriggers (front – back) = 161.4"
Outriggers (left – right) = 161.4"
Stabilizer pads 11.8" X 11.8"
Outrigger foot 4.72" circumference
Maximum lift capacity: 2194 lbs (minimum radius)
Maximum slope 10° up slope, 4° degree side slope
Ground contact pressure: 5060 ft. lbs.
Maximum boom length 30 ft. – 35 ft with mechanical extender
Slewing speed: 1 rev/1.11 second (rabbit), 1 rev / 1.22 (turtle)
Noise level: 90 db (A)

Test Report No: DI1210372-000

Date, 2013-01-29
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MANUAL DELIVERY COUPON

✂----------

I, the undersigned .....
as ☐ operator ☐ executive ☐ holder

of: .....

declares to have taken over Nr..... copies of the use and maintenance manual of the machine Nr ..... of copies of the safety manual for operators in charge of using and performing maintenance on the elevating work platform and Nr ..... safety belts.
Manual delivery coupon of the elevating work platform:

Model: ..... Serial Number: .....

Fonte di Roccadaspide, date: ……..... Signature
(legible)

Copy for the customer

✂----------

I, the undersigned .....
as ☐ operator ☐ executive ☐ holder

of: .....

declares to have taken over Nr..... copies of the use and maintenance manual of the machine Nr ..... of copies of the safety manual for operators in charge of using and performing maintenance on the elevating work platform and Nr ..... safety belts.
Manual delivery coupon of the elevating work platform:

Model: ..... Serial Number: .....

Fonte di Roccadaspide, date: ……..... Signature
(legible)

Copy for the dealer

✂----------

I, the undersigned .....
as ☐ operator ☐ executive ☐ holder

of: .....

declares to have taken over Nr..... copies of the use and maintenance manual of the machine Nr ..... of copies of the safety manual for operators in charge of using and performing maintenance on the elevating work platform and Nr ..... safety belts.
Manual delivery coupon of the elevating work platform:

Model: ..... Serial Number: .....

Fonte di Roccadaspide, date: ……..... Signature
(legible)

Copy for CORMIDI srl

✂----------

OEM Rental Distributor
4175 Guardian Street
Simi Valley, CA 93063
info@mmdequipment.com
www.mmdequipment.com
P 800-433-1382 F 800-225-5579